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THE PLANNING OF CAPITAL WORKS

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THE PLANNING OF CAPITAL WORKS

Capital construction in the Soviet Union is carried out on a vast scale.

The construction began in the prewar years in every branch of the national economy, first of all in heavy industry, was a necessary precondition for the construction of socialism in the USSR and the creation of the material possibilities which insured the economic victory of the Soviet Union in the war against Hitlerite Germany.

The postwar period has been characterized by a still wider scope of capital construction. Six thousand large state industrial enterprises were built in the USSR in the 9 years between 1929 and 1937. More than 8,000 large state industrial enterprises were restored, built, and commissioned in the 9 postwar years between 1946 and 1954. More than 30 million sq m of housing space were built in the socialized sector during the first and second five-year plans. About 220 million sq m of housing space have been restored and built during the postwar period in towns and settlements alone. The capital works completed in 1954 alone exceeded those of the entire Second Five-Year Plan.

The present large-scale development of capital construction is the direct result of the problems of building communism in the USSR. The creation of a material-industrial base of communism calls for the continued forced development of the heavy industry; this requires enormous capital investments.

By far the largest part of capital construction in the USSR is carried out under the statewide plan of the national economic

development. The theory and practice of socialist construction have evolved the basic principles of the state planning of capital works in the national economy as a whole, as well as in its various branches.

This work is devoted to a brief outline of the methods of planning capital works in the national economy of the USSR as a whole.

CHAPTER I. THE MEANING OF THE CAPITAL WORKS PLAN  
AND ITS PLACE IN THE STATE PLAN  
FOR NATIONAL ECONOMIC DEVELOPMENT

Planning capital works (or capital investments) means planning the expanded socialist reproduction of the basic capital funds of the national economy.

The place and significance of the capital works plan are determined by the exclusive role of the growth and perfection of the basic funds, particularly the basic industrial funds, in the systematic and proportional development of the entire national economy.

Basic production funds represent implements of labor as distinguished from objects of labor. Basic production funds are the products of labor used for production purposes but, unlike working capital or objects of labor (which are entirely consumed in production), wear out gradually and therefore continue to participate in the production process while retaining their natural form. The cost of the basic funds is added to the cost of production gradually, in proportion to their depreciation. The basic production funds consist first of machines as well as industrial

buildings and installations, instruments and stocks (except inexpensive and nondurable ones), irrigation installations, and working and productive livestock.

Nonproductive basic funds also consist of durable stocks but these are of a nonproductive nature and are used for consumption: houses, buildings, and installations such as schools, hospitals, theaters, clubs, museums, etc as well as their equipment.

The national property, that is the sum total of all the products of labor accumulated by society, consists of basic production and nonproductive funds, working production funds (raw materials, materials, and fuel), stocks of consumer goods and the household property of the population. The basic funds constitute the major and largest part of the combined total of material wealth.

The significance of basic capital, particularly basic production funds, goes far beyond their relative share of the national property. The producer goods as a whole -- both the implements and objects of labor -- represent the necessary material prerequisite for productive activity. The significance of the implements of labor and objects of labor, however, is not the same. "Everyone knows," J. V. Stalin wrote, "that raw material cannot by itself produce the implements of production, although certain types of raw material are required for producing such implements, while no raw material can be produced without the implements of production" (J. V. Stalin, Ekonomicheskiye problemy sotsializma USSR /Economic Problems of Socialism in the USSR/, 1953, Gospolizdat, page 54).

One of the peculiarities of production is that its changes and development are always determined by the changes and development of the implements of production. The planning of the

development of productive forces therefore means, first, the planning of the expansion and perfection of the basic production funds and their core, the production implements.

The material base for the expansion of the reproduction of basic capital (metals, machinery and production equipment, timber and mineral construction materials), as well as the power base for the operation of the basic funds (fuel, electric power) comprise the heavy industry branches. Precisely for this reason heavy industry plays a leading part in the national economy. The preferential development of heavy industry secures the expanded reproduction of the basic capital and its fuel-and-power base in every branch of the national economy on the basis of advanced technology.

The most important part of the basic capital, machines and production equipment, is produced by heavy industry as a finished product. But in most cases their exploitation is impossible without the use of buildings, installations, roads, etc. Not only the machines that have to be assembled but even such products of the machine-building industry as automobiles, locomotives, and railway cars require the use of roads, garages, depots, etc, for their exploitation. Heavy industry produces building materials, parts, and finished components for the construction of buildings and installations. But actual construction and assembly work is carried out by a special branch of the national economy, the construction industry. In the great majority of cases the material base of the basic capital, which is a product of several heavy industry branches cannot be turned into operative basic capital without construction and assembly work.

Participating also in the expanded reproduction of basic capital is agriculture (perennial plantations, livestock reproduction), as well as transportation and communication to the extent to which they contribute to the reproduction of basic capital.

The expanded reproduction of basic capital means that the new and redesigned basic stocks not only replace those no longer usable but also increase the total quantity of such stocks. The expanded reproduction of basic capital also presupposes major repair work to compensate for the partial depreciation of the basic capital under exploitation. Heavy industry serves as the material base for such repair work, but the work itself is carried out partly by the construction industry and partly by the respective enterprises themselves.

Several industries are thus the immediate participants in the expanded reproduction of basic capital: first, heavy industry which produces the most important part of that capital: machines, equipment, mechanisms, and even construction materials; next comes the construction industry which implements the expanded reproduction of buildings and installations and the assembly of equipment; agriculture's part in it is the planting of perennial plantations and the increase in livestock herds; transportation and communication contribute to the reproduction of basic capital.

The capital repairs aspect of the reproduction of basic capital is carried out by all the enterprises of the national economy.

Expressed in monetary terms, the entire work volume in the national economy designed to expand the reproduction of basic capital consists of capital works (or capital investments) and capital repairs.

Capital repairs used to be part of the capital repairs plan. It was later found necessary, however, to separate the capital repairs plan from the general plan for the expansion of basic capital, and that practice was introduced in 1938. The main reason for that was that the capital repairs of basic production stocks usually interrupt their operation for a certain time and therefore also a corresponding reduction in the enterprise's production possibilities. This induced certain industrial managers to improve their production indexes by overloading the working equipment and unseasonable repair work. To enhance the responsibility of the management for timely and high-quality capital repairs, it was found necessary to allocate special funds for that purpose. Besides, the earmarking of special capital repair funds is also necessary to keep the new construction and repair work from interfering with the efficient operation of the basic capital under exploitation.

Under the system in use since 1938, a certain part of the amortization fund, kept on a special account in the State Bank, is used for capital repairs on the basic stocks of all self-supporting enterprises and organizations. The enterprise is not allowed to spend that part of the amortization fund on anything except capital repairs of its basic stocks.

The significance of the proper utilization of capital repair funds has now been enhanced because since 1954 the indexes of the state plan for the development of the national economy no longer reflect the specific tasks of the ministries in regard to the volume of capital repairs of their basic stocks as well as the capital repairs of very important objects. Thus the planning of the capital repairs of the basic stocks is now up to the ministries

themselves. State control over the timely implementation of capital repairs is, of course, still in force. This control is exercised by checking the accumulation, and particularly the timely and proper utilization, of the special funds for capital repair purposes.

The deductions from the amortization funds for capital repair purposes are not the same in all branches of the national economy. The differential deduction norms credited to the special account in the State Bank represent certain percentages of the amortization funds. The average deductions for capital repairs amount to about 1/2 the amortization fund. In certain cases the obsolescence of the basic capital and corresponding changes made in the deductions of capital repairs must be considered.

The rest of the amortization fund is credited to the general income of the economic organizations and serves as a source for capital construction. Strictly speaking, the part of the capital construction of new and redesigned objects financed by amortization funds cannot be considered an accretion of basic capital. At present, however, the actual amount of basic capital made unusable every year in the USSR's national economy is smaller than the amortization fund minus its portion designed for capital repairs. In view of this, a certain part of the amortization funds actually serves as a source for the expanded reproduction of basic capital under the existing deduction norms. This is explained by the relatively large share of new basic capital and the rapid process of renewing the basic capital in the USSR.

Due to the wide scope of capital construction, the capital investments in the USSR are several times higher than the costs of

capital repairs; the capital investments now exceed the costs of capital repairs by approximately 7-8 times.

Thus:

1. The volume of capital works (capital investments) is the total monetary expression of the volume of the basic capital reproduced during a given period that does not take into account the reimbursement for partial depreciation (capital repairs).

2. The accumulated part of the national income and a certain part of the amortization funds for basic capital serve as a source for capital works.

The capital works plan is an integral part of the national economic plan. It is subordinated to the same general objective as is the entire national economic plan. That objective is defined by the fundamental economic law of socialism: the maximum satisfaction of the constantly growing material and cultural needs of the whole society through the continuous expansion and perfection of socialist production on the basis of the latest technology.

As regards the capital works plan, this general task becomes concrete in the specific tasks which reflect the peculiar characteristics of that particular part of the national economic plan and characterize KP [Kommunisticheskaya Partiya] policy on capital investments.

First of all, the capital works plan must insure the continuous increase in the basic production stocks at a high tempo. This is a necessary precondition for meeting the requirements of the fundamental economic law of socialism which calls for the continuous expansion of every branch of socialist production. Contingent upon

it is the solution of the basic economic problem of the USSR posed by the CP -- to outstrip the major capitalist countries in the per capita production of the most important types of industrial commodities.

The rapid increase in the basic capital stocks calls for a correspondingly large share of the surplus accumulation in the national economy since the accumulation of basic stocks plays a major part in the total surplus accumulation of national wealth. The large relative weight of surplus accumulation, in turn, depends on the commodity structure of material production and on the relative share of the production of producer goods in the national product. With the exception of a relatively small accretion of consumer goods stocks, the major part of the accumulated surpluses consists of increased basic capital and raw material and fuel stocks. The increase in unproductive basic capital is also made possible by the production of the first subdivision. For this reason, the preferential development of the production of producer goods, particularly of heavy industry, is the basis for the successful solution of the problem of increasing the expansion rate of basic capital under the capital works plan.

The solution of the first problem of the capital works plan depends largely on the correct distribution of a given volume of capital investments between construction projects and individual construction jobs. In regard to the utilization of capital investments, the CP's policy is to concentrate primarily on the most important productive construction projects and objectives. The party demands that a determined struggle be waged against the dissipation of funds on numerous objectives. The concentration of investments

in productive and other important construction projects and objectives is the most important method of introducing new production capacity and basic capital which means increasing the expanded reproduction of basic capital.

The second problem in the planning of capital works is to insure the continuous perfection of the basic capital stocks in socialist production.

The solution of this problem in capital construction is in keeping with the requirements of the fundamental economic law of socialism -- the continuous perfection of production on the basis of advanced technology. The perfection of production results in a higher productivity of social labor -- a decisive condition for the victory of the new, socialist system. The perfection of the productive forces involves all the methods used to economize added and embodied labor in the production of material wealth. In a socialist society this is made possible by constant technical progress.

Technical progress in the national economy is attained by continuous renovation of basic production capital and improvement in production technology. The material basis for this is the improvement of the commodity output of such branches of the heavy industry as metallurgy, machine building, construction materials industry, and the chemical industry, as well as the corresponding development of the fuel and power industries.

Thus the first and the second problems of planning capital works are realized by coordinating the plan of capital works with the plan for the development of heavy industry. Under this

arrangement, the capital works plan -- the plan for the expansion and perfection of basic capital -- makes certain claims on the plan for the development of heavy industry. The necessity for increasing the volume of, and improving the basic capital calls for appropriate changes in the output of the heavy industry.

Thus, for example, the plan for the construction of hydroelectric power plants calls for a specified number and quality of hydroturbines, hydrogenerators, automation facilities, etc, required for the mentioned power plants. The production of electrical equipment for the hydroelectric plants, in turn, calls for a special assortment of ferrous and nonferrous rolled metal and other heavy industry products. Of course the technical characteristics of these constructions are first determined by possibilities in heavy industry. But in such interdependence, the maximum expansion and perfection of the basic capital constitutes a task that can be solved by expanding and perfecting heavy industry.

Moreover it is precisely the new problems of expanding and perfecting the basic stocks of the national economy, as expressed in the capital works plan, that determine heavy industry's decision on certain problems of technical progress. Thus, for example, the long distance transmission of high-voltage current became the first item on the heavy industry's agenda precisely because of the construction of huge hydroelectric power plants. The problem of developing various new types of agricultural machines was brought to the foreground in connection with the complex mechanization of agricultural work and the appropriate plan for the development and perfection of the basic capital in agricultural production, etc.

Outlining a plan for the expanded reproduction of basic capital, the CP and the government are implementing a policy of promoting technical progress in every way. Every new plant, factory, power plant, mine, railroad, machine-tractor station as well as every expansion and reconstruction of the operating basic capital must be based on the highest achievements of Soviet and foreign technology.

The failure of several machine-building and other branches of the heavy industry to keep in step with technical progress tends to slow the expansion and perfection of basic capital as well as the development of the entire national economy.

In its decision "On the Problems Relating to the Further Development of Industry and Technical Progress and the Improvement of Production Organization," the July plenum of the TsK [Tsentral'nyy komitet -- Central Committee] of the KPSS [Kommunisticheskaya Partiya Sovetskogo Soyuza -- Communist Party USSR] adopted a militant program for the further perfection of the socialist industry. "The most important task of the KP, Soviet, and economic organizations in industry," says the decision of the plenum, "is to improve in every way the technical level of production and insure the implementation of the national economic plan at the same time." The rate of technical progress in all branches of industry must be sharply increased. This is attainable on the basis of the electrification, complex mechanization, and automation of production processes, the introduction of new and highly efficient machines and apparatuses, the constant improvement of production technology and the use of atomic energy for peaceful purposes.

The CP and the government call for decisive technical progress in every branch of the national economy. This applies particularly to a high standard of construction projects. Construction projects should be patterned after the most advanced models. They are called upon to prod heavy industry into continuous technical improvement, into taking economical and progressive measures. In reality, however, the planning of such projects not only fails to cope with these tasks, but also lags behind the achievements already made in developing heavy industry.

The July plenum of the TsK KPSS made it obligatory ". . . to provide for the highest possible indexes, as compared with those of the advanced Soviet and foreign enterprises, during the planning of new enterprises and the expansion of existing ones."

The third problem in the planning of capital works is to coordinate the development tempos of productive basic capital in the various fields of material production in such a way as to make them conform to the law of the systematic proportional development of the national economy. The constant proportionality among the various industries and the smooth development of the numerous branches of the national economy calls for a definite structure of the new basic capital. It is impossible to commission a new power plant, for example, without also commissioning the enterprises or any other organizations which are expected to be the major consumers of the power produced by that plant.

The necessary large-scale long-range changes in the industrial structure of socialist production are achieved mainly by establishing a proper correlation between the rates of increase in the productive basic capital of the various industries, that is,

through a definite apportionment of capital construction among the industries.

Thus, for example, the most important aspect of technical progress, the electrification of the national economy, provides that the capacity of the power plants exceed the development of the entire national economy. Only thus is it possible to create the necessary prerequisites for the continued extension of electric power to every production process, and to improve such production processes on the basis of electric power.

Thanks to the consistent realization of the proportional development of the national economy of the USSR, the production of electric power is considerably greater than the output of the other industries. The figures shown below show the correlation between the rates of increase in the gross industrial output and in the production of electric power:

|                           | <u>1940 com-</u><br><u>pared to</u><br><u>1928</u> | <u>1950 com-</u><br><u>pared to</u><br><u>1940</u> | <u>1955 compared</u><br><u>to 1950 (Five-</u><br><u>Year Plan)</u> |
|---------------------------|--|--|--|
| Gross output of industry  | 6.5 times  | 173%   | 170%   |
| Electric power production | 9.6 times  | 187%   | 180%   |

This faster rate of electric power production is achieved by the large-scale construction of power plants. About 500 power plants, not counting small ones, were built and expanded in the first 4 years of the Fifth Five-Year Plan alone.

The fourth problem in the planning of capital works is a better geographical distribution of productive basic capital. That is one of the most effective methods of saving social labor. Rational distribution of production is inherent only in a socialist

national economy based on the public ownership of the implements and producer goods.

The KP policy on the matter of basic capital distribution reflects the advantages of the socialist system of national economy in the sphere of the economic and cultural development of the various districts of the country.

The following policy toward the distribution of production was adopted by the resolution of the Eighteenth CP Congress on the Third Five-Year Plan for the development of the national economy of the USSR (1938-1942),

"The Congress believes that the distribution of the new construction projects under the Third Five-Year Plan in the various areas of the USSR should be governed by the necessity of getting the industry closer to the raw material sources and consuming areas with a view to eliminating the irrational and exceedingly long hauling distances as well as developing the economically backward areas of the USSR" (KPSS v resolyutsiyakh i pesheniyakh s"ezdov, konferentsiy i plenumov TsK /Resolutions and Decisions of the Congresses, Conferences, and TsK Plenums of the KPSS/, Part 2, seventh edition, pages 897-898). With this in mind, the KP Congress established a system under which commodity production in every economic district -- and the production of certain types of commodities in every republic, kray and oblast -- would meet the demand for the respective district, republic, kray and oblast for particular types of goods. The congress decided to build in the eastern areas, the Urals, and the Volga region several duplicate enterprises of the machine-building, oil-refining, and chemical industries to "prevent the possibility of misusing the output of certain commodities by the unique enterprises

(predpriatiya-unikumy)" (Ibid.). The congress outlined a more rapid development of capital works in the eastern and far eastern areas of the USSR, as well as a further economic and cultural development of the national republics and oblasts.

The policy adopted by the Eighteenth KP Congress on the distribution of capital construction, as well as the congress' definition of the sizes and types of the construction projects have retained their great importance to this day.

The July plenum of the TsK KPSS (1955) noted a marked improvement in the distribution of the industry in the country. While the output of industrial commodities in the USSR as a whole in 1954 was 2.8 as much as in 1940, the industrial output volume in the eastern areas showed a 4-fold increase during the same period. At the same time the plenum also pointed out that "the implementation of the Nineteenth CP Congress directives on the improvement of the geographical distribution of industrial enterprises was not satisfactory." The plenum called for the elimination of the existing shortcomings in the distribution of the productive forces and the improvement of the statewide planning of the distribution of productive forces in the country in conformity with the KP directives on improving the geographical distribution of industrial enterprises, on locating the industries closer to the raw material and fuel sources and consuming areas; also, on the specialization and complex development of the economic districts and on a faster rate of industrial development in the eastern areas of the country. It is necessary to restrict the further concentration of industrial enterprises in several large cities. To tackle the problem of greater specialization and cooperation in industry, the plenum found it necessary

to create in various districts of the country well equipped and specialized foundries, drop-forging, mitis, and woodworking plants.

The socialist distribution of productive forces is effected chiefly through a systematic improvement in the distribution of new productive basic capital in the country.

The improvement in the distribution of productive basic capital consists, first of all, in the rational exploitation of the natural resources through the forced development of new areas. Hence the close connection between the solution of this capital works problem and the achievements in geological prospectin\_.

Further, the improvement in the distribution of basic capital means the complex development of the economic areas and the introduction of an appropriate rational system of freight hauling.

The distribution of productive forces under socialism aims to develop the economy and, first of all, t e industry of the national republics and backward economic districts on the periphery of the country; the aim of liquidating the heritage of capitalism, the economic inequality of those districts vis-a-vis the industrialized centers of the country.

The improvement of the distribution of socialist production should also be guided by the necessity of strengthening the socialist fatherland's defense.

The fifth problem of the capital works plan is to insure the steady growth and perfection of unproductive basic capital and the necessary industrial and territorial proportions in the unproductive sphere.

The social and cultural measures of the socialist state play a vast part in insuring the maximum satisfaction of the needs of society. In a socialist economy the capital investments in the construction and equipment of the housing and communal economy, hospitals, sanatoriums, schools, theaters, stadiums, etc, are made according to a state plan and are financed from surplus funds.

Only a small part of the increase in unproductive basic capital is achieved by the people themselves: this applies mostly to individual housing construction. But even in this respect the state plan provides for definite measures designed to help individual builders with credits, building materials, etc.

Nor can the solution of the problem of reproducing unproductive basic capital, under the capital works plan, be restricted to a mere definition of the volume of such capital. Here, too, the problem is not only the expansion but also the perfection of unproductive basic capital as well as the coordination of basic capital expansion in this particular sphere and in the various areas with the production requirements and consumer needs of the population. Suffice it to point to the vast importance of the growing housing and cultural construction not only in meeting the population's needs but also in the systematic enlistment of labor forces for the newly settled areas, in combatting labor turnover, etc.

Capital works play an important part in securing the basic capital for defense purposes and in expanding and improving the basic stocks designed to strengthen the country's defensive capacity.

The sixth problem of the capital works plan is to reduce the duration and cost of construction and improve its quality by industrializing construction on the basis of advanced technology. This

problem expresses the KP's policy in construction as an integral part of its policy for capital investments.

Although the reproduction of basic capital is carried out by several industries, in addition to the construction industry, it is precisely the construction industry that completes the process of creating and introducing new basic capital in the national economy (with the exception of the ordinary acquisitions of equipment that requires no assembling). The construction industry puts up buildings and installations and assembles equipment thereby putting into operation most of the basic capital. The construction and assembly work carried out by the construction industry plays a large part in the growing volume of capital investments. That is why the plan of the construction industry represents an integral part of the general plan of capital investments.

The plan-specified tasks of developing the construction industry are designed to help improve continuously the performance of construction and projects organizations. That improvement is manifested in the maximum acceleration of construction, the commissioning of new buildings and installations, the most economical use of funds allocated for construction and assembly work, and the improvement of the quality of construction work.

The decision adopted by the TsK KPSS and the Council of Ministers USSR in August 1955, "On Measures for Further Industrializing Construction, the Improvement of its Quality and Reduction of Costs" offers a broad program of raising the construction industry to the level of the present-day requirements of communist construction in the USSR.

Emphasis should be placed on the very close connections between all the problems of the capital works plan. In particular, the maximum acceleration of construction, the reduction of its cost, and raising its quality on the basis of industrialization increase the possibilities for the best possible solution of all problems in capital investments. The shorter the construction periods, the cheaper and better the construction work and the greater the possibilities for the continuous expansion and perfection of the basic capital and the fixing of the necessary industrial and territorial proportions in the reproduction of basic capital.

Discussed above was the direct and immediate connection between the various problems of the capital works plan relating to the technical renovation of basic capital and the development of heavy industry. In the final analysis, the solution of all the problems connected with the capital works plan depends on the development level and structure of heavy industry production. Hence the objective necessity of coordinating the development of heavy industry with the requirements for the expansion and perfection of basic capital in the national economic plan.

The close interconnection between capital works and heavy industry is similar to that existing, for example, between the assembly and other major departments in a machine building plant. The output of the assembly department depends entirely on the output of such major departments as the foundry, forge shop, and mechanical department. On the other hand the output of these major departments is determined by the national economy's demand for their commodities which can be completed only by the assembly department.

It is of the utmost importance for taking full account of the concrete and objective interdependence of the various branches of the national economy if the requirements of the law of systematic and proportional development are to be reflected in the plan.

If the capital works plan reflected the achievements of the heavy industry passively it would fail to solve its problems. Of course the production level of machines, metal, construction materials, etc, puts the capital works plan within certain limits. But in the first place, as far as basic capital is concerned, capital works plan determines the expansion rate and structural changes in the production of the heavy industry itself which is the largest "basic-capital" industry in the national economy; secondly, it is precisely the production of basic capital, its expansion, perfection, and rational distribution as well as the industrialization of construction that poses certain problems before the heavy industry and, particularly, machine building.

Hence the enormous importance of the capital works plan in determining the necessary direction of technical progress and in substantiating the plan for the development of heavy industry as a whole.

Emphasis should be placed on the particularly important part of the capital works plan in the realization of the perspective problems of the development of the national economy. While the national economic requirements in the current year have been met almost entirely by the productive basic capital in operation since the beginning of the year, the further large-scale expansion of production, the substantial increase in labor productivity, the important changes in the proportions among the various industries

and the achievements in the distribution of productive forces in the country, in other words, the tempos and proportions of the expanded reproduction of the national economy in the coming years depend primarily on the rate of expansion and the changes in the industries' and territorial shares of the newly acquired basic capital.

Capital construction is, by its very nature, of long range significance. It is not merely a matter of construction or the number of large projects under construction over a number of years. This, of course, is very important. It requires planning several years ahead; without such planning it would be impossible to secure the proportional expansion of basic capital in various industries. But the long range nature of capital construction is still more determined by the fact that basic capital is used for several years after it had first been put into operation. This raises the following problems:

First, the drafting of the capital works plan should take into account the requirements of the national economy in the next 10 to 15 years; hence the necessity for long range general plans for the development of the national economy and its major branches;

Second, the basic capital commissioned according to the plan should be properly combined with the basic capital that has been functioning at the beginning of the plan period and will for the most part be out of commission by the end of the plan period; hence the necessity for coordinating the plan for new construction work with the plan for expanding and rebuilding the existing enterprises bearing in mind the perspective development of the national economy in the next 10-15 years.

The advantages of socialist production are manifested with particular force in the successful solution of all the above-listed problems of the systematic development of capital construction in the USSR. Clearly revealed in the capital construction of the USSR are the progressive changes occurring in the socialist economy. The expansion rate and structure of capital investments in the USSR reflect an objective basically different from that of capitalism and which governs production; it reflects a basically different method of attaining that objective, and the nature of the changes in the industrial, territorial, and social proportions in the socialist national economy.

Capital construction in the USSR is carried on at unprecedented tempos. During the First and Second Five-Year Plans the basic capital in industry showed an average annual increase of 22%. In Tsarist Russia, even when capital construction was at its highest (1885-1913), the average annual increase in basic capital amounted to only 7.2%. The average annual increase in basic capital in US industry between the 2 world wars was only 4%.

Reckoned in present prices, the volume of state capital investments in the national economy of the USSR amounted to: in 1929-1932, 68 billion rubles; in 1933-1937, 158 billion rubles; and in the postwar period to the end of 1954, over 900 billion rubles. In 1955, 167.2 billion rubles were appropriated for capital investments.

The realization of the vast problems of communist construction calls for a further rapid expansion and improvement of the basic capital. Speaking to the Eighteenth CP Congress, J. V. Stalin pointed out that the solution of the basic economic problem

of the USSR, that is exceeding the capitalist per capita production of the major types of industrial commodities, ". . . requires, first of all, a strong and indomitable desire to march forward, a willingness to make big sacrifices and large capital investments with a view to expanding our socialist industry in every way" (J. V. Stalin, Voprosy leninizma [Problems of Leninism], eleventh edition, 1953, page 618).

The wide scope of capital construction in the USSR is made possible by the high level attained in the development of the heavy industry, the absence of parasitic consumption in the country and the resultant large surplus in the national income and the systematic utilization of funds in keeping with the requirements of the economic laws of socialism.

About 1/4 of the national income in the Soviet Union has been used for surplus accumulation both in the prewar and postwar periods. In the capitalist countries, on the other hand, despite the much smaller share of workers' consumption in the national income (about 40% in the US as against the 7% in the USSR), the surplus accumulation does not exceed 1/10 of the national income even in prosperous years. In the capitalist countries about 1/2 the national income is spent on the upkeep of the exploiting classes and their numerous parasitic servitors and for other unproductive purposes, particularly in education. The part of the national income used for surplus accumulation in the US averaged about 10% in 1919-1928 and only 2% in 1929-1938.

The greatest advantage of a socialist society is that its productive relations do not impede the process of the continuous technical renovation of basic capital. The systematic and rapid

replacement of old techniques by new ones is an insoluble problem for a capitalist economy.

The capitalist does not go in for the replacement of an old and outdated technology by a new one unless it brings higher profits. The capitalist uses a new machine only if it is cheaper than the labor it displaces. The introduction of new machines under capitalism is therefore relatively narrowly confined. It is determined by the difference between the price of the machine and the cost of labor it displaces. It is not the saving of social labor but a saving on wages, and higher profits, that makes the use of a new machine profitable for the capitalist. K. Marx wrote that ". . . the law of increasing labor productivity has no objective meaning to capital. As far as capital is concerned, an increase in labor productivity does not mean a saving of human labor; all it means is that the amount saved on the cost of current labor is greater than that of past labor. . ." (K. Marx, Kapital, Vol III, 1954, page 273).

The monopoly stage of capitalism strengthens the tendency to hinder technical progress. This does not mean that under the domination of monopolies technical progress halts; it is maintained by unceasing competition under imperialism. The tendency to artificially hinder the renovation of basic capital, however, has increased. The mass freezing of patents on inventions, practiced by the monopolies, is a natural phenomenon born of the very nature of imperialism which represents a decadent and dying capitalism.

Under conditions of public socialist ownership, in contrast to a private capitalist economy, there are no objective barriers to the replacement of old techniques by new ones.

In a socialist society the technical renovation of basic capital is carried out wherever "it can save human labor." The criterion for introducing new machinery in socialist production is whether it saves social labor on a national scale which may be required, say, for producing a certain volume of national income in one year.

The use of such a criterion for introducing new machinery creates favorable conditions for speeding up technical progress. This means, particularly, the acceleration of so-called "moral" depreciation. In a socialist economy, in contrast to a capitalist economy, there is a possibility for the systematic replacement of the old and morally worn out techniques by more advanced new techniques.

The substitution of new machinery for old machinery can be successfully realized with due "returns" for the national economy only if there is a well thought out coordination of the technical progress of the various branches of socialist production. This can be attained, first of all, by the perspective planning of the national economy and its various branches.

In a socialist economy, no enterprise can have any objective reasons for fearing the appearance of new equipment at a similar enterprise. Competition has no place in it. New machinery may be used in one enterprise today and in all the others tomorrow if a saving on a national scale can thereby be achieved.

The most important criterion for the use of new machinery in a socialist economy is the national economic effect produced by such machinery. And this effect itself is determined not only by

the amount of savings it may produce for the national economy immediately after the introduction of new machinery, but also by the amount of social labor to be saved by the use of the new machinery over several years to come. In this respect, too, the socialist system of economy is radically different from capitalism and from all the preceding economic systems. "All the systems of production in existence heretofore were geared primarily to the achievement of the immediate and most profitable effects of labor.

. . . Since the capitalists' object of production and exchange is immediate profit, their prime considerations are only the immediate and direct results" (K. Marx and F. Engels, Izbrannye proizvodeniya [Selected Works], Vol II, 1946, pages 81-82).

The objective conditions of a socialist economy create vast possibilities for the continuous renovation of basic production capital on the basis of advanced technology.

The fact that certain economic managers still cling to obsolete machinery and that shortcomings are still noted in the planning and the introduction of new machinery and in the system of encouraging and stimulating technical progress has nothing to do with the nature of socialist economy. It merely serves to show the tenacious nature of routinism and inertness which are incompatible with the socialist system of economy and against which the KP and Soviet Government are waging a decisive and implacable struggle.

The July plenum of the TsK KPSS (1955) pointed out that ". . . that the major causes of the unsatisfactory introduction of new machinery into the national economy are weak leadership on the part of the ministries and department chiefs in the matter of mastering the exploitation of new machines, mechanisms, instruments, and

apparatuses and using new types of materials for progressive technology; conceit and complacency on the part of many high-ranking industrial leaders, and their loss of a sense of responsibility for the job at hand."

The advantages of the socialist economic system, as compared to the capitalist system, in the growing rate of capital construction and the rapid and continuous improvement and renovation of basic capital, are also decisive in predetermining the increasing rate of material production as a whole, particularly industrial production. In the past quarter century, the average annual accretion of industrial output in the USSR (not counting the war years) amounted to 18.2%; in the US, only 2.4%; in England, 3.6%; and in France, 2.1%.

The advantages of a socialist economy in capital construction are expressed not only in the rate of expansion and the continuous improvement of the basic capital but also in the direction of capital investments.

In capitalist countries the investments in basic capital are distributed spontaneously, most of them going into industries and areas where the highest profits are expected.

The systematic capital investments in the USSR, made on a statewide scale, are determined entirely by the fundamental economic law of socialism.

The objective law of the systematic and proportional development of the national economy, functioning under socialism, makes it possible for the leading and planning organizations to use the capital works plan for establishing the necessary proportions of public

production conforming to the requirements of the fundamental economic law of socialism. In the Soviet Union the capital investments in the various branches of the national economy are determined not by the immediate profit to be derived from the particular branch, important as that may be, but by the part such investments will play in solving statewide problems.

Thus, for example, in implementing the Soviet type of industrialization, the KP was guided by the enormous benefits to be gained in regard to the rate of development of the entire national economy. Although light industry requires smaller investments, and profits can be made more easily than in heavy industry, industrialization in the USSR began not with the light industry, as it did in the capitalist countries, but with heavy industry. Otherwise it would have taken several decades to industrialize. "The CP remembered Lenin's words to the effect that the country's independence could not be defended without heavy industry, and that the Soviet system could be destroyed without it. That is why the USSR rejected the 'usual' course of industrialization and began to industrialize the country by developing heavy industry. The difficulties were great but they were surmountable. This was greatly facilitated by the nationalization of industry and banking which made it possible to direct the flow of funds to heavy industry" (J. V. Stalin, Rechi na predvbyornykh sobraniyakh izbireteley Stalinskogo izbiratel'nogo okruga [Speeches at the election meetings of the Stalin District voters of Moscow city], Gospolitizdat, 1953, page 19).

The advantages of the socialist economy in distributing productive forces are no less manifest in capital construction.

The Soviet country fell heir to Tsarist Russia's ugly method of distributing production. The economic geography of the country has undergone a change under the Soviet Government. The relative share of the eastern and national districts in the output of the most important types of commodities has been sharply increased. And this is primarily of great economic importance.

Vast territories with their incalculable natural riches have now been included in the process of socialist production. Tsarist Russia actually had only one coal base, the Donets Basin. No matter how well it might have been developed, it could not possibly have produced as much coal (even from the viewpoint of its production limitations alone) as it now produced together with the Kuznets, Karaganda, Pechora, and other coal basins. Coal production is now approximately 13 times as high as in 1913.

The rational distribution of production means, further, an enormous saving on freight shipments.

Long-distance freight hauling is still increasing in the USSR. But the size of the territory in the USSR covered by production development should be borne in mind. "It may be stated as certain," L. M. Kaganovich said, "that if we had failed to struggle for the proper socialist distribution of productive forces and the all-round development of the economy in the republics and oblasts, our long-distance freight-hauling volume would have been much greater than it is today" (L. M. Kaganovich, Rech' na pervoy sessii Verkhovnogo Soveta SSSR, chetvertogo sozyva [Speech at the First Session, Fourth Convocation, of the Supreme Soviet USSR], Gospolitizdat, 1954, page 8). The advantages of the socialist distribution of production are particularly clearly revealed when

comparing the hauling distances with the size of the country's territory. The US territory is about 1/3 of that of the USSR, but the average hauling distances are not much longer than in the US: in 1950, the average railroad freight-hauling distance in the US was 700 km, and in the USSR 722 km.

Despite our achievements we still have many shortcomings. The volume of long-distance hauling is still large. The most important precondition for reducing long-distance hauling is the elimination of shortcomings in the distribution of the country's productive forces. The correct distribution of the new enterprises also facilitates the successful solution of the problems related to strengthening the USSR's defensive capacity. The realization of the farsighted policy of the KP and government on the distribution of industry, agriculture, and transportation in the USSR produced the great production possibilities in the eastern areas which played such a decisive part in the material supply of the front and the rear during the Great Fatherland War. In 1943 the eastern areas alone produced more commodities than did the whole of Tsarist Russia in 1915: 2.3 times as much coal, twice as much steel, 1.7 times as much ferrous rolled metal, 4.1 times as much copper, 18.8 times more zinc, and 59 times as much lead. By the outbreak of the Great Fatherland War grain production in the eastern areas exceeded the output of those areas in Tsarist Russia by 1.6 times.

The colossal past and current achievements in the distribution of productive forces in the Soviet Union are based primarily on the proper distribution of the new construction projects.

The Soviet state concentrates in its hands the bulk of the surplus accumulations, in the form of budget revenues and profits

of the state enterprises, and distributes them (mostly as capital investments) among the various branches of the national economy, by economic areas and union republics, according to the economic and political requirements of a given period.

It should be emphasized that the socialist system of economy creates the objective advantages not only in regard to the scope and direction of capital investments but also in regard to their economical utilization in construction.

No capitalist country has such favorable conditions for the development of the construction industry as the USSR and the people's democracies. The present serious shortcomings in the organization of construction are not necessarily produced by the objective conditions of socialism; they reflect a still inadequate ability of certain organizations and officials to make full use of the advantages of a socialist economy.

Only under socialism can the enlargement of the construction organizations, their specialization and rational distribution, their cooperation in the production of construction objects and parts, and their systematic work load determined by long range development be carried out on a large scale under a well thought out long range plan which provides for the necessary labor force, materials, and finances.

Of particular importance for the systematic realization of capital construction, as we have seen, is the continuous coordination between capital works and the long range development of the national economy as a whole. This is impossible under conditions of capitalism, under conditions of competition and anarchy of production. This accounts for the very uneven development of capital

construction, against a background of general cyclical development, in the capitalist countries. Characteristic in the latter are the frequent changes from a feverish influx of capital into a particular industry or area to a similarly feverish flight of capital from that industry or area.

In the USSR's national economy there is not a single industry, economic area, or union republic where the volume of capital investment in basic capital is not increased from year to year.

The capital works plan for every year provides for investments designed not only to produce new basic capital during the plan year but also for construction projects to be commissioned in the future.

The long range plans for the development of a socialist national economy, based as they are on an objectively possible and necessary constant proportional level, represent a departure point for the systematic stockpiling of facilities in the field of basic capital reproduction.

"Social production," K. Marx pointed out, "will have to be used as a basis for determining the scale of long-range operations which require a labor force and production facilities without producing an immediate effect; the scale of these operations will have to be determined so as not to adversely affect the branches of production which not only use a labor force and production implements permanently or several times a year, but also produce vitally important commodities and producer goods" (K. Marx, Kapital, Vol II, 1953, page 356).

Under capitalism, capital investments and construction projects designed for future use contain the germs of future disproportions inasmuch as they cannot be coordinated with the investments of other capitalists, other areas, etc, from the point of view of proportional distribution required for the smooth development of social production as a whole.

Under socialist conditions, on the other hand, it is precisely the long range plans for the national economic development as a whole and their integral part, the long range capital works plans, that are used primarily to forestall disproportions in the national economy and to establish more progressive future proportions in keeping with the perspective development of production and advanced technology.

#### CHAPTER II. THE CONTENT OF THE CAPITAL WORKS PLAN

The system of indexes of the national economic plan as a whole is built to reflect all the phases of expanded socialist production and all the most important connections and proportions among the industries, areas, and forms of ownership.

At present the state plan for the USSR's national economic development contains the following targets: (a) the production, distribution, and utilization of the most important types of material wealth and services expressed in physical and monetary terms; (b) the training of workers and specialists and the utilization of labor resources in the national economy; and (c) the accumulation and utilization of the income of the state, various organizations, and the population.

Such a system of indexes actually amounts to a ramified system of national economic indicators. Only the coordination of all indicators of this system in the national economic plan can reflect the requirements of the law of systematic and proportional development. Only the optimum combination of all indicators of this plan, from the viewpoint of the scientific aspect of the economic-political problems of the plan period, reflects the conformity of national economic planning to the requirements of the fundamental economic law of socialism.

In view of this, the system of indicators for each section of the national economic plan is built so as to permit its complete coordination with the other sections of the plan on the basis of the economic and political problems of the given plan period. It is precisely for this reason that national economic planning cannot be restricted to mere resultant indicators of the development of any one particular branch of the economy, decisive as they may be. For example, the output of very important types of industrial commodities, in physical terms, is the resultant indicator of the industry, and is therefore part of the system of indexes for the appropriate ministries, departments, and the councils of ministers of the union republics. But these indicators cannot be established without an analysis of the possible and necessary expansions of industry's production capacity and a better utilization of such capacity; without an analysis of the expenditure of production implements and labor in industry; without an analysis of the changes in uncompleted production; without an analysis of the distribution of the production and consumption of industrial commodities; and without an analysis of the connections between group "B" of industrial production and commodity circulation, etc.

This reveals the necessity for computing the number of indicators, most of them not reference indicators nor ones fixed by directives, but which are of first-rate importance for coordinating the industrial production program with the other sections of the national economic plan, namely: indicators of available industrial production capacities, the norms of utilization of the most important types of equipment, raw material, fuel, etc, in industry, industry's gross and commercial commodity output, including "A" and "B" commodity groups, the production of industrial goods by economic areas, and the available foodstuffs and other goods, etc.

The same may be said also of any other section of the plan including the capital works plan. The system of indexes of the capital works plan includes both reference (directive) and calculated indexes, and the combination of the 2 can be used to substantiate the capital works plan and all its connections with the other sections of the national economic plan.

What are the major connections between the capital works plan and the other sections of the national economic plan? These connections follow from the very essence of the capital works plan and the problems of the state plan of national economic development which are solved with the aid of the capital works plan.

First, the capital works plan serves as a basis for the long-range production development plan as far as the accretion of productive capacity is concerned; it also serves as a basis for the production plan for a given year to the extent that such a plan depends on the new production capacities introduced during the given year.

Second, the capital works plan serves as a basis for the expansion of housing construction and communal economy, education, public health service and art, as well as of administrative and defense organizations.

Third, the capital works plan is used for determining the distribution of new productive forces by economic areas and union republics and the complex development of their economy, for locating production closer to raw material sources and consuming areas, for the development of the backward peripheral areas, the liquidation of irrational and excessive long-distance freight hauling, and the strengthening of the country's defensive capacity.

The capital works plan, finally, calls for adequate supplies of labor, material, and financial resources.

In view of these very important connections, the capital works plan is drafted on the basis of the following major indexes.

#### 1. The General Upswing in Capital Works (or Capital Investments)

The planned volume of capital investments for a year, 5 years, etc, characterizes the increase in the estimated value of all basic capital in the national economy during the plan period. (See Note) This represents the over-all increase in basic capital, both in operation and still uncompleted, expressed in monetary terms.

(Note) Here and elsewhere the word "value" is used not in the strictly theoretical sense of the word since it applies to the products of labor which, in a socialist society, have lost their characteristics of commodities as such; it is used in the sense now popularly applied in planning and accounting.)

What is the estimated value used for determining the volume of capital investments?

The estimated value of basic capital or its uncompleted portions consists of the following component elements: (a) expenditures according to estimates made on individual construction projects and portions of them, including the equipment under construction, according to fixed prices and the cost of installing the equipment; (b) cost of equipment, requiring no installation, at fixed prices.

The volume of capital investments includes certain funds which, while not increasing the value of basic capital, are connected with its construction. These are the expenditures involved in the reproduction of basic capital: the cost of training qualified workers for the enterprises under construction, the cost of the managerial staff of the enterprises under construction, the cost of relocation (as, for example, in places flooded by water reservoirs under construction), etc.

On the other hand, some of the expenditures connected with the reproduction of basic capital are not reflected in the capital investments plan. First to come under this category are the expenditures on project-research work as well as expenditures involved in expanding stock herd reproduction. In the general inventory accounts, however, these expenditures are charged to basic capital.

The formation of the estimated values of individual projects will be discussed below. In the meantime it is important to point out that the same estimated value is used for planning the gross

volume of capital investments in both the national economy and its various branches for several years regardless of the changes in the prices and expenditures on certain types of work.

Thus in the field of capital investments planning, use is made of the principle of identical values applied, in monetary terms, to the same objects and their structural components of various industries over the same number of years.

Here the comparable estimated value is used in the same way as industry uses the comparable estimated cost of commodities expressed in the wholesale prices of the enterprise (without the turnover tax) in force as of a certain date. Thus since 1937 the estimated cost of construction was determined on the basis of the 1936 prices and after 1947, on the basis of the 1945 prices. Recently the volume of capital investments has been planned on the basis of the estimated values existing since July 1950. The present changeover to estimated costs is based on the norms and prices existing on 1 July 1955.

The comparability of different capital investment volumes of different years is very important. It makes it possible to analyze the dynamics of the volume of capital works and the changes in its structure; it makes it possible to compare the volumes of capital investments actually made with those of plan investments.

In a broader sense, the coordination of the capital works plan with the entire national economic plan is achieved by comparing the total volume of capital investments with the national income.

It is very important to determine the proper volume of capital investments in the initial stage of the drafting of the national

economic plan. The coordination of the capital works plan with the national income and its structure, however, is not enough for such determination. To make certain that the planned volume of capital investments is practicable, it should be provided with equipment, construction materials as well as labor force. The volume of capital investments, however, cannot be directly weighed against the material resources allocated for the reproduction of basic capital and labor resources. Other indicators are used for that.

## 2. The Structure of Capital Investments

### The Cost Structure of Capital Investments

The following items are allotted from the planned capital investments to meet the material and labor requirements of the construction itself: the volume of construction and installation work, the cost of equipment and other expenditures. The requirements in raw materials and additional cadres of construction workers are determined not by the entire volume of capital investments but by the volume of construction and installation work.

Construction work includes the erection, reconstruction, and expansion of permanent and temporary buildings and installations (furnaces, mines, dams, quays, bridges, roads, etc); technical sanitation construction and wiring for electric lights; the laying of groundwork and the construction of foundations, supporting structures for equipment, outer brick walls for boilers and furnaces, etc; the clearing and preparation of land tracts for planned construction, such as the removal of old buildings, tree felling, stubbing, drainage work, flattening mounds and filling in hollows on the land, etc; landscaping and tree planting on the construction

site; reclamation work (irrigation, drainage, etc); planting of perennial plants (gardens, vineyards, plantations, nurseries, etc); canal construction and dredging work.

Installation work includes the assembly and installation of equipment in permanent and temporary projects as well as the testing of the mentioned installations; the building of industrial transmission lines which are part of the installed equipment, the construction of service platforms and ladders functionally connected with the installation as well as the insulation and painting of the equipment.

The share of construction and installation work in the total volume of capital investments in the national economy amounts to about 60%. This share, however, fluctuates in different industries and in different years due to the changes in the nature of construction, value changes, etc.

Capital investments in equipment consist of investments in equipment requiring installation and investments in ready-to-use equipment. The installation of equipment means setting it up on a foundation or on supports. Such types of equipment as electric or steam power machinery, rolling mills, machine tools, overhead cranes, lifting cranes, etc, cannot be put into operation before they are installed.

Ready-to-use equipment is put into operation without any installation work. This includes locomotives, railway cars, ships, barges, motor vehicles, tractors, agricultural machinery, cutting machines, etc.

The cost of equipment accounts for more than 1/3 of the total volume of capital investments.

Other expenditures figuring in the total volume of capital investments are those incurred in connection with construction work but which do not increase the value of the basic capital (the cost of training qualified workers for the enterprises under construction, etc.).

The item "other expenditures" also used to include those allotted for research projects and geological prospecting work. At present such expenditures are not included in the volume of capital investments but are included in special accounts in the state budget appropriations. The expenditures on research projects used to be included in the total volume of capital investments so that they might be used to strengthen financial control over the performance of the projects organizations. But the cost of such research projects is included in the cost of the basic capital after it has been put into operation.

The expenditures on geological prospecting work cannot be included in the cost of any one individual project since they apply to all projects that have ever been and will be built in that particular prospected area. Economically, geological prospecting work comes under the category of scientific work. On the other hand, however, it should be borne in mind that geological prospecting is determined first by the requirements of basic capital reproduction in general and its distribution in particular.

Geological prospecting is included in the total volume of capital investments to the extent that it directly affects the

expansion of the basic capital of certain enterprises. This applies to drilling operations and prospecting in depth now carried out by the oil extracting enterprises.

The estimated cost of individual projects usually consists of 3 integral parts of capital investments.

Allocations for construction and installation work from the total volume of capital investments make it possible to establish the necessary proportions between the expansion of construction and installation work, on the one hand, and the increase in the material resources and labor power for construction purposes, on the other. Neither the cost of equipment nor the amount of other expenditures has a direct bearing on the required expenditure of materials and labor in construction. Besides, the allocations for construction and installation work are important for planning the operations of the construction organizations.

The supply of labor force, cement, lumber, metal, etc, earmarked for the construction and installation plan in the initial drafting stage of the national economic plan tends to adjust the total volume of capital investments although that volume is coordinated with the surplus end of the national income. These adjustments facilitate the establishment of definite limits to capital investments.

#### The Ownership Structure of Capital Investments

The total volume of capital investments in the national economy consists of: state capital investments which are predominant in a socialist economy; capital investments by collective farms, industrial and other cooperative organizations; and, finally, individual capital investments (mostly in housing construction).

The ownership structure of capital investment is very important, particularly in the perspective plans, for analyzing the development of production relations based on the various forms of ownership of the producer goods.

Besides, the determination of the volume of state capital investments is necessary with a view to its eventual distribution among the ministries, departments, and councils of ministers of the union republics. The part of the over-all capital works plan based on government directives or applying to specific areas is financed mostly by state capital investments. This, of course, does not preclude state control over capital construction in the collective farm and cooperative sector.

#### The Industrial Structure of Capital Investments

The industrial structure of capital investments is very important from the point of view of its coordination with major economic and political problems. The basic economic and political problems of a particular period predetermine the branches of the national economy requiring increasing investments in basic capital.

The changes in the industrial structure of capital investments are closely tied to the correlation of the rate of expansion of various industries.

Thus, for example, during the Fourth Five-Year Plan the top priority problem of restoring and developing the heavy industry and railroad transportation served to change the industrial structure of the capital investments in the national economy. According to the plan, the investments in industry in 1946-1950 amounted to 63% of the total volume of capital construction as against the 47-48%

before the war. In 1946-1950 railroad transportation accounted for 16% of the capital works plan as against the 12% before the war.

In keeping with the KP's general line which is the preferential development of heavy industry, a large part of state funds is being invested in that industry as well as in railroad transportation. During the 1929-1952 period, the following capital investments were made by the state (as reckoned in today's prices): in heavy industry, 638 billion rubles; transportation, 193 billion rubles; light industry, 72 billion rubles; and agriculture, 94 billion rubles.

Now that the heavy industry is undergoing continuous forced development, the KP and the government are carrying out large-scale measures designed to bring about a radical improvement in agriculture. This called for a considerable increase in the capital investments in agriculture. The 1955 appropriation for agricultural expansion amounted to 65.2 billion rubles including 55.1 billion rubles from the state budget. These funds are used to equip agriculture with the latest machinery and implements, expand the area under cultivation by working the virgin and fallow lands, and create a stable fodder base for the livestock industry.

It is precisely through the changes in the industrial structure of capital construction that the most important changes of national economic proportions are achieved.

#### Completed and Uncompleted Capital Investments

The total volume of capital works in the national economy and its various branches is further divided into completed and uncompleted capital investments. Completed capital investments are investments made during a given period in projects going into

operation in the same period; uncompleted investments are those applying to projects scheduled to go into operation at a future time.

To establish the proper structure of capital works, according to immediate needs, it is important not to scatter the funds used for construction. Completed capital construction means commissioning new productive capacities in the same year. The volume of uncompleted capital investments, on the other hand, predetermines the future commissioning of new projects and the material reserves for the capital construction required for increasing the productive capacities in the future, within the next years. In view of this, the concentration of funds on projects to be commissioned and other highly important objects should be accompanied by an allocation of sufficient funds for creating a material reserve required for the future development of the national economy.

What, then, is the optimum correlation between completed and uncompleted investments? This correlation cannot be used as a constant criterion for the national economy as a whole nor for its various branches. This is how the correlation between completed and uncompleted capital investments was formed during the prewar five-year plans (in billions of rubles, at the prices of the respective periods):

|   | <u>First Five-Year Plan</u> | <u>Second Five-Year Plan</u> | <u>Third Five-Year Plan (as planned)</u> |
|---|-----------------------------|------------------------------|--|
| (1) Uncompleted capital investments as of beginning of five-year plan | 1.7                         | 13.7                         | 25.1                                     |
| (2) Capital investments   | 50.5*                       | 114.7                        | 192.0                                    |
| (3) Commissioning of basic capital                                    | 38.5                        | 103.3                        | 193.0                                    |

|  | <u>First Five-<br/>Year Plan</u> | <u>Second Five-<br/>Year Plan</u> | <u>Third Five-<br/>Year Plan<br/>(as planned)</u> |
|--|----------------------------------|-----------------------------------|---|
| (4) Increase or decrease<br>in uncompleted in-<br>vestments (2-3)  | + 12.0                           | + 11.4                            | - 1.0   |
| (5) Uncompleted capital<br>investments at end<br>of five-year plan   | 13.7                             | 25.1                              | 24.1  |
| (6) Uncompleted capital<br>investments at end<br>of five-year plan<br>in % of the capital<br>investment volume<br>of the last year of<br>the five-year plan<br>(approximately) | 90.0                             | 80.0                              | 50.0  |

\* Including capital repairs and above-limit expenditures.

This computation is to some extent inaccurate since the capital investments include expenditures that do not increase the value of basic capital. Such expenditures, however, are not large, and they may be ignored in this computation.

The figures in the table characterize the substantial changes in the material reserve for capital construction. At the end of the First Five-Year Plan that reserve equalled about 90% of the annual volume of capital investments, while at the beginning of the five-year plan it had amounted to about 35%. That is explained by the peculiar characteristics of the five-year plan which was pivoted on the construction program. It was with a very small stockpile of materials available at the beginning of the five-year plan that large-scale construction got underway throughout the country, particularly in the heavy industry, and continued to expand from year to year. Although 1,500 large industrial enterprises were put into operation during the First Five-Year Plan, many enterprises remained uncompleted by the end of 1932.

During the Second Five-Year Plan the relative size of the material stockpile was somewhat reduced while its absolute size was increased by 1.8 times. This shows that the process of systematically increasing the annual rate of commissioning new basic capital was formed during that period.

The Third Five-Year Plan even called for a decrease in the absolute volume of uncompleted capital works by accelerating the introduction of basic capital through the industrialization of construction and the struggle against "giant mania" in construction.

An analysis of uncompleted capital investments also requires a definition of the extent of completion of the projects under construction.

The scattering of funds may in certain cases bring about a reduction in the volume of uncompleted construction. To increase the rate of basic capital reproduction, it is important that the available material stockpiles be ready for immediate use.

The planning of material stockpiles for construction is of primary importance in organizing rhythmic construction work which makes construction faster and cheaper and accelerates the expansion of the socialist reproduction of basic capital.

Noting that Glavmosstroy successfully fulfilled its obligations to build 900,000 sq m of living space in 1954, and create a larger material stockpile in 1955 than in 1954, N. S. Khrushchev said,

"These results show that the new organization took a big forward step since material stockpile in construction is the main

thing, I would say the most important thing. Anyone can see that it is impossible to maintain rhythmical construction work without a normal stockpile. Where there is no stockpile, the skilled workers are not used according to their training -- for earth-moving and auxiliary work. This results in lower labor productivity, higher construction costs, and disrupted work schedules. With a necessary stockpile on hand it is possible to work rhythmically, without interruption, and to use the workers according to their skills" (N. S. Khrushchev, O shirokom vnedrenii industrial'nykh metodov, ilichshenii kachestva i snizhenii stolimosti stroitel'stva [On the Large-Scale Introduction of Industrial Methods, the Improvement of the Quality and Reduction of the Cost of Construction], Gospolitizdat, 1955, pages 14-15).

Although the concrete correlation between completed and uncompleted investments cannot be finally fixed a correct methodological approach to the establishment of this correlation in the plan appears to be quite definite. It may be described as follows: the given volume of capital investments must be designed to produce the maximum quantity of completed investments that would insure the commissioning of the most important operational projects on a priority basis.

Such an approach is borne of the necessity for the maximum acceleration of construction. In this sense the struggle against expanding the volume of uncompleted construction coincides with the struggle for a faster rate of construction. At a given level of completed capital construction, the increasing volume of uncompleted capital investments in new projects, or those still under construction, means to increase the degree of their completion and,

consequently also, to accelerate the process of basic capital reproduction. For this reason the increase in uncompleted construction at a time when the largest possible volume of completed investments under the plan has been achieved amounts to increasing the stockpile of materials without detriment to the construction projects nearing completion, and is of great national economic importance. For practical purposes, however, the national economic plan always provides for a definite volume of capital investments and a definite maximum of possible accretion of basic capital within the plan period. The problem is to make the best possible use of the uncompleted investments with a view to creating a stockpile of materials in the decisive branches of the national economy and to insure the most rapid commissioning of the new projects at the same time.

The directives of the Nineteenth CP Congress on the Fifth Five-Year Plan make it mandatory "to create material stockpiles in the construction of metallurgical enterprises, power plants, oil-refining plants, chemical plants and coal mines with a view to insuring the necessary development of these branches of industry in the coming years" (Direktivy XIX s"ezda partii po pyatiletnoy plany razvitiya SSSR na 1951-1955 gody [Directives of the Nineteenth CP Congress on the Fifth Five-Year Plan of the Development of the USSR for 1951-1955], Gospolizdat, 1953, page 5).

Capital Investment in New Construction, Reconstruction, and Expansion

In planning capital works much significance is attached to the breakdown of the total volume of construction in the national economy and its various branches to new construction, reconstruction, and the expansion of existing enterprises.

The change in the relative weight of new construction in the total volume of capital investments is directly related to the duration of construction, its cost, and the coordination of the capital works plan with the technical plan. The distribution of productive forces also varies with the particular volume of new construction.

The further development and creation of new fuel and power bases as well as the all-round development of the economic areas and union republics is implemented mostly with the aid of new construction. The solution of these problems, during the drafting of the capital construction plan, is based on the necessity of utilizing every possibility for expanding and reconstructing the existing enterprises; this makes the expansion of basic capital faster and cheaper than the construction of new enterprises. The Nineteenth CP Congress directive says that "the expansion of the existing enterprises should be utilized as an important basis for increasing production at the lowest possible cost" (Ibid.).

Also defined in the national economic plan is the structure of the total volume of capital works as determined by economic areas and union republics. It is this structure that primarily determines the progress in the distribution of productive forces in the country.

3. The Plan for the Introduction of Basic Capital and Production Capacities in Various Industries

All the above-listed indicators present an over-all picture of capital investments: the structure of investments and their distribution by social sectors, industries and districts and their relation to the extent of completion and renovation of basic capital. These indicators, however, do not characterize the ultimate results of the investments.

Geared to the demands of the national economy for more production capacity, the plan for the production of new basic capital is the determining factor in the entire capital construction plan. It characterizes the results of capital construction, so to speak, the returns on capital investments, that is the finished product of construction.

The plan for the introduction of new basic capital and production capacities determines the volume and structure of capital investments. Although the final plan for the expansion of basic capital is drafted after all the calculations of the capital works plan have been made, it is precisely the demand for new basic capital that is used as a criterion for these calculations; the requirements for a given period; hence the volume and structure of completed investments; that is the requirements for future years; hence, also, the volume and structure of uncompleted investments, that is the volume and structure of the current stockpile. For this reason, as will be shown later, the production capacity factor is used as a basis for planning the reproduction of basic capital.

4. Capital Investments and the Addition of New Basic Capital per  
Ministries, Departments, and Councils of Ministers of the Union  
Republics

It is these indicators that are approved in the national economic plan since they indicate the specific assignments, tied in with the indexes for the Soviet Union as a whole, to various industries and economic areas.

The plan drafts submitted by the ministries, departments, and councils of ministers of the union republics serve as a basis

for the detailed elaboration of the social, industrial and territorial aspects of the plan and for an analysis of the planned changes in the structure of capital investments.

#### 5. Title Lists

The capital investments approved for every ministry, department, and council of ministers of the union republics are divided into above-limit and below-limit investments.

Above-limit investments are those applying to constructions and projects individually approved by the government in the title lists. Beginning with 1934, the government has been fixing definite and differential limits of estimated costs of construction projects, for various industries, with a view to including such projects in the state plan. If the estimated cost of a construction project of a particular ministry equals or exceeds the government-fixed limit, such a project must be approved by the government and included in the title list which is submitted along with the draft of the entire national economic plan. The title lists of construction projects whose estimated cost is below the fixed limit are approved by the respective ministry. The ministries are thereby granted certain rights and possibilities for independent distribution and redistribution of a certain part of the capital investments.

Differential limits of the estimated cost of above-limit projects are fixed for various industries. At present they range from 5 to 25 million rubles. The capital investments in above-limit construction projects account for more than 1/2 of all capital investments.

Thus the above-limit investments appearing in the government-approved title lists are subdivided into individual construction and other projects. Reflected in the title lists, also, are: the volume of, and time required for the addition of, new production capacities and basic capital; the distribution of new construction projects; the concentration of funds on projects to be commissioned; and the creation of material stockpile for the construction of different projects.

The below-limit investments, although not approved in detail within the national economic plan, must also be substantiated in every way. The plan for below-limit investments must indicate the purpose of such investments: the expansion of the existing enterprises and plant shops, new enterprises, power plants, dwelling houses, public health institutions, etc and also the expenditures on equipment requiring no installation.

#### 6. The Plan of the Construction Industry

The capital works plan contains a system of indexes for one of its special subdivisions, the construction industry plan: the distribution of construction and installation work by construction organizations, technical progress in construction, increase in labor productivity, reduction in the cost of construction-installation work, etc.

Thus the directional and designated indexes of the capital works plan apply to the organizations whose basic capital is expanding (client organizations) as well as to those carrying out the construction (construction organizations). Sometimes those indexes coincide -- if an economic organization does its own constructing.

However when the volume of contract work is particularly large, the major part of the capital works plan is assigned to the client, on one hand, and the building contractor, on the other. This peculiar way of designating the plan is due to the characteristic features of the construction industry which will be discussed below.

The state planning of capital works goes through the same stages as the planning of the national economy as a whole. In regard to place and significance, however, the capital works plan differs from the other subdivisions of the plan at various stages.

The definite economic and political problems of the development of the national economy during a given plan period (five-year plan or one year), as outlined by the CP and the government, represent the departure point for drafting the plan itself. Normally, a system of so-called control figures for the development of the national economy during a given plan period is worked out on the basis of CP and government directives and on the basis of long-range plans. When the control figures are approved by the government, they serve as a guide for the various ministries, departments, and councils of ministers of the union republics in working out their plans.

Practice has shown that the most essential feature, from the point of view of planning organization, is not only the provision of increased production by industries in the first stages of the plan but also the fixing of capital investment limits for the ministries, departments, and councils of ministers of the union republics. The capital investment limits determine the needs and possibilities of the national economy for expanding the basic capital

in the various ministries. These possibilities cannot be determined by the ministries and departments themselves, and the capital investment limits must therefore be fixed by a central body before the final draft of the plan.

Quite another thing is the utilization of these investments as well as the utilization of the existing and added basic capital, the utilization of labor force, etc. The solution of these questions call for wider initiative from all the workers.

The planning of the national economy reflects the creative effort and initiative of millions of workers. It is their advanced experience that forms the basis for plan assignments. J. V. Stalin pointed out that the ". . . production plan reflects the living and practical activities of millions of people" (J. V. Stalin, Sochineniya [Works], Vol 13, page 80). The KP directs the planning of the national economy not only by its leadership over the planning organs but also by its daily work among the masses of workers, peasants, and Soviet intelligentsia. The KP organizations of the various localities, plants, mines, construction projects, collective and state farms, scientific institutions, and projects organizations, etc, mobilize the reserves which form the foundation of the progressive norms specified by the plan. Developing self-criticism and criticism from below among the masses, the KP organizations disclose new production reserves within individual branches of the national economy, as well as reserves that facilitate the improvement of interindustry and interrayon proportions and connections, the enhancement of the practice of self-sustaining operations, the improvement of the wage system, etc.

The drafting of plans after the control figures have been approved cannot be considered as merely giving concrete expression to general tasks already outlined. The control figures of production are the minimum tasks subject to improvement locally and by the active participation of millions of workers. By approving the directives, or control figures, the government sets up a minimum, not a maximum, for production, labor productivity, etc. The capital investment limits, on the other hand, represent a maximum with which the ministry must comply in its planning of production, labor productivity, surpluses, etc, for its enterprises.

The fixing of capital investment limits before the final draft of the local plans is of much organizational importance; it makes it possible to coordinate the plan projects of individual organizations with the national economic possibilities for the reproduction of basic capital.

The plan projects worked out on the basis of capital investment limits and submitted to the government by the ministries, departments, and councils of ministers of the union republics contain detailed figures on all the above-discussed indexes of the capital works plan. It is thus made possible to combine the state-wide plan calculations with projects submitted by individual organizations, so to speak, and achieve an optimum coordination with a view to assuring the state-wide needs, as well as those of the different ministries and departments of the union republics.

The difference in the expansion tempos of different industries is chiefly and primarily determined by the distribution of the total volume of capital investments among the industries. Consequently the determination of the desired distribution of the major

part of the accumulations, basic capital accumulations, in the first stage of the plan drafting serves as a methodological basis for defining the proper proportions in the locally drafted plan projects.

Thus the fixing of state limits on capital investments prior to the drafting of local plan projects is one of the most important preconditions for reflecting the requirements of the law of systematic proportional development in every plan project submitted by the localities. This is very important since national economic planning depends largely on such projects coming "from below" ... from enterprises and rayons through ministries, departments, and councils of ministers of the union republics.

The planning of capital works on a national economic scale is substantially different from planning capital works for an individual ministry, rayon, enterprise, etc. And this is not only because the scales of planning are different.

The drafting of a capital works plan by an individual ministry is based on several conditions that apply to that particular ministry: the plan projects are contingent upon the availability of so many funds (financial and material) to the ministry, on such and such a numerical increase of workers, on so many orders from its clients, etc. These conditions cannot be estimated and determined by the ministry itself.

But the planning on a state-wide scale is qualitatively different in that it is expected to substantiate the capital works plan in every possible way. And such substantiation is possible only when the planning is done on a national scale. Reflected in the national economic plan is the actual state of affairs. The system

of computing material, financial and labor resources makes it possible to substantiate every task outlined in the plan.

The substantiation of the capital works plan is governed by the following important objectives:

1. Substantiation of the plan with a view to meeting the requirements of the national economy for the reproduction of basic capital.
2. Substantiation of the plan by providing it with the necessary material, labor and financial resources.

### CHAPTER III. SUBSTANTIATION OF THE CAPITAL WORKS PLAN WITH A VIEW TO MEETING THE REQUIREMENTS OF THE NATIONAL ECONOMY

The substantiation of the capital works plan, like any other part of the whole plan, consists first of all in its coordination with the volume and structure of the national income.

The higher the rate of national income accretion, the larger the material funds available for consumption and accumulation in the national economy, the larger the funds designed to meet the current demands of society and facilitate the expansion of production. The increase of the national income per industrial worker represents growing labor productivity, the most important resultant indicator of improving production. The faster the growth of the national income as a whole -- at a given numerical strength of workers in the production field -- the higher the degree of socialist production improvement on the basis of advanced technology.

The growth of the national income in the USSR, all of it the property of the working people, is strikingly demonstrated in that

the KP's economic policy is governed by the basic economic law of socialism.

The growth of the national income in the USSR is characterized by the following figures:

|              | <u>1913</u> | <u>1928</u> | <u>1932</u> | <u>1937</u> | <u>1940</u> | <u>1950</u> | <u>1954</u> |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| In % of 1913 | 100         | 119         | 217         | 459         | 611         | 1,002       | 1,500       |
| In % of 1928 | 34          | 100         | 162         | 385         | 513         | 842         | 1,260       |

Thus the 1954 national income was 15 times that of 1913 and 12.6 times that of 1928. While in the capitalist countries the national income expands at a snail's pace, and with interruptions, and the workers' share of the national income is steadily diminishing, the national income in the Soviet Union continues to grow at an unprecedented rate and is used exclusively to meet the people's needs.

Assuming that the elimination of parasitic consumption, the liquidation of open and concealed unemployment, and the natural increase in population have combined to double the number of workers engaged in material production as compared with 1913, social labor productivity in the USSR in 1953 was more than 7 times that of 1913 -- and this against the background of a shorter work day, better working conditions, and no unemployment.

The planning of capital works facilitates the best solution of the problem of tempos and proportions in the national economy, that is a solution that would insure a maximum increase in the national income. The continuous coordination between the planned volume of capital investments and the national income with its accumulations facilitates the achievements of both the desired

proportions within the economy and the subordination of the capital works plan to the requirements of the basic economic law of socialism.

The basic objective of the part of the national income allocated for accumulation is the increase in basic capital. Consequently, the determination of the optimum coordination between consumption, accumulation, and reserves within the national income is closely tied to the determination of the possible and necessary volume of capital works within the limits of a given national income.

In the long-range plan for the development of the national economy the volume of capital investments is determined by the aggregate national income for the years to be covered by the plan. This, of course, requires that account be taken of the structure of the accumulated part of the national income, the relative increase in basic capital, and the possible variations in that increase.

If, for example, the part of the national income to be accumulated over the entire five-year plan amounts to a thousand billion rubles, and the accumulation of basic capital accounts for about 90% of the total, then the total investment in the five-year plan will amount to about 900 billion rubles -- expressed in the same monetary value as the entire national income.

The rate of increase of the national income and, therefore, also, its volume in each year of the five-year plan largely depend on the scale, structure, and the efficiency of capital works. It should not be assumed, therefore, that the national income and its

structure, in their final form, are allegedly determined first and the volume of capital works afterwards. These very important indicators are gradually defined and exert a mutual effect on each other, in the process of drafting the national economic plan. The conformity of the actual national income under the plan with the planned volume of capital investments, however, must be maintained at every stage of the plan drafting.

Thus the conformity of the capital works plan with the requirements of the national economy is reflected very generally in the link-up between the total volume of capital investments and the accumulated part of the national income.

In its natural-material form, the accumulated part of the national income represents a growing stockpile of various industrial and agricultural products and an increase in basic capital. The excess of capital investments over the basic capital accretion included in the accumulation equals the amortization sum required for capital construction purposes.

Thus before comparing it with the volume of capital investments, the accumulated part of the national income should be reduced by the amount of working funds and increased by the amount of basic capital accretion through amortization.

To tie in the volume of capital investments with the accumulated portion of the national income, it is necessary also to express the compared items in the same monetary values.

The monetary evaluation of the planned volume of capital works now in use is such as to make possible a comparison between the capital works of different industries, different years, etc.

The same volume of construction or installation work is expressed in the same monetary values regardless when and where it has been carried out. The same also applies to the valuation of equipment and other elements involved in capital works. At present the comparison of different volumes of capital works through the medium of money is achieved by the use of the uniform estimated cost of capital works in existence on 1 July 1955.

The national income is also calculated in prices which have been compared over several years -- but not the same prices -- and used for estimating the cost of capital works.

The difference in the prices may be quite large. Although this difference does not prevent the correct determination of the dynamics of the national income and the dynamics of capital investments -- since a different set of prices is used for each type of dynamics -- it is still impossible to draw a comparison between the absolute amounts.

Thus, for example, if we compare the corresponding figures of the Fourth Five-Year Plan we will get the following results (in billions of rubles):

|   |        |
|---|--------|
| National income under the 1950 plan<br>(in 1926-27 prices)            | 177    |
| Relative weight of accumulation                                       | 21%    |
| Absolute extent of accumulation                                       | 37.2   |
| Capital investment volume for 5 years (in<br>estimated costs of 1945) | 250.3  |
| Approximate volume of capital investments<br>in 1950                  | 60- 70 |

It appears that the entire accumulation (37.2 billion rubles) is much smaller than the volume of capital investments (60-70 billion rubles). It should be borne in mind, however, that the 1945 estimate prices were considerably lower than the 1926-1927 prices in which the national income was expressed. Thus, to compare the volume of capital investments with the accumulated portion of the national income in this case we should at least know the average index of the estimated costs of 1945 as it relates to the cost of capital works in 1926-1927.

A direct comparison between the capital investment volume and the accumulation fund of the national income calls for a corresponding recalculation of the monetary valuation of the capital works volume.

To make an approximate estimate of the possible and necessary volume of capital works during the plan period, it is sufficient to determine the rate of increase of the accumulated portion of the national income in the plan period as compared with the preceding plan period. Subject to certain conditions, the percent of increase in the volume of capital works, reckoned in comparable prices of the estimated cost, equals the percent of increase in the accumulated portion of the national income in comparable prices.

In this chapter the problem of substantiating the volume of capital works with the necessary assortment of resources is put aside for the time being. From a methodological point of view it is important to use the requirements of the national economy as a guide for the planning of capital works with a view to determining the possibilities for providing the necessary labor, material and financial resources for the desired volume of capital works.

This, of course, does not preclude the existing practice of interweaving the analysis of capital works from the viewpoint of the national economic requirements with its analysis from the viewpoint of material procurements for it. The decisive role of the national economic requirements, however, always remains in force. This means that the efforts of the planning organs are directed not toward the subordination of the capital works plan to the available resources but, on the contrary, to bringing the resources up to the level required for the implementation of the desired volume of capital works.

There is an objective possibility for that as long as the expansion of the capital works volume is coordinated with the increasing accumulation in the national income. Indeed if the growing national income is accompanied by a numerical increase in the labor force engaged in material production and an increase in labor productivity, it may be stated with confidence that the expansion of accumulations is assured. This, in turn, determines not only the necessity but also the possibility for securing a corresponding increase in the volume of capital works.

The amount of the national income, the basic capital accumulation, and the total limit of capital investments in the national economy are gradually defined with greater precision during the drafting of the national economic plan.

The coordination of the total volume of capital works with the accumulated portion of the national income is only the first, though very important, step toward the establishment of the necessary proportions between capital works and the development of the entire national economy.

In addition to defining the total volume of capital works, it is necessary to coordinate its industrial structure with the planned development of the different branches of the national economy. Such calculations are, of course, approximate and general. They are very important, however, for maintaining the desired proportionality in the different variants of the plan under consideration.

The industrial structure of the capital investments, as shown in the preceding chapter, reflects in summary form the CP policy in distributing funds among the various industries according to their part in communist construction.

The industrial structure of capital investments makes possible an approximate definition of the actual proportion between the rate of increasing capital investments by industries and the planned rate of development of these industries. Such proportional development, however, cannot be verified by a direct comparison between the increasing rate of capital investments (investments in industry, for example) and the increasing rate of commodity output. Such a direct comparison would amount to economic illiteracy since the increasing rate of capital investment does not necessarily equal the expansion of basic capital; the increase in commodity output, on the other hand, directly depends on the expansion of basic production funds.

Let us take a hypothetical example (say in billions of rubles and in comparable monetary expression):

|   | <u>Current Year</u> | <u>Plan Year</u> | <u>In %</u> |
|---|---------------------|------------------|-------------|
| Basic production funds at year's end          | 205                 | 225              | 109.7       |
| Average annual basic production funds         | 200                 | 220              | 110         |
| Capital investment during the year            | 15                  | 20               | 133.3       |
| Uncompleted capital investments at year's end | 10                  | 10               | 100         |
| Commodity output                              | 100                 | 120              | 120         |

Such correlations are quite possible. Actually, if the amounts of uncompleted capital investments at the beginning and end of the plan year are equal, the volume of capital investments coincides with the volume of the commissioned new basic capital. That is exactly why the basic capital was increased by the amount of capital investments, that is by 20 billion rubles (225-200). A comparison between the growing commodity output and the increasing volume of basic production funds (better yet, with the average annual increase in basic production funds) will lead to the conclusion that an improvement in the utilization of basic capital is being planned: the commodity output is increasing at a faster rate than the basic capital. As for the capital investments, their rate of increase is much faster than the output of commodities, and particularly in comparison with basic productive capital.

Consequently, before analyzing the proportional relation between the industrial structure of the capital investments and the planned increase in commodity output by various industries, it is necessary to establish the expansion rate of the annual average basic capital which will be attained under the planned volume of capital investments in these industries.

The correlation between the increasing commodity output and expanding basic capital is very important inasmuch as it reflects, in a general way, the efficiency of basic capital utilization.

The output of industrial commodities in the postwar period, as compared to 1940, was greater than the expansion of basic production capital, while the prewar output of commodities expanded at a slower rate than the basic production funds. Here are the pertinent figures:

|   | <u>1937 in \$</u><br><u>of 1928</u> | <u>1937 in \$</u><br><u>of 1932</u> | <u>1950 in \$</u><br><u>or 1940</u> |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| Expansion of production funds<br>in industry      | 243                                 | 237                                 | 156                                 |
| Increase in gross commodity<br>output of industry | 230*                                | 232*                                | 173                                 |

\* Heavy industry

It should be emphasized, however, that these total results are obtainable when vast reserves of equipment are available for use in several industries. Thus in the coal and lumber industries there is still an obvious disparity between the increasing technical equipment of these industries and the rising efficiency of labor employed in coal extraction and lumber production.

An analysis of the general proportions, made by approximate calculations and with the aid of general indexes, important as it may be, is still quite inadequate for substantiating the capital works plan. Such an analysis cannot reveal the connections between the capital works plan and the requirements of the national economy for more basic capital.

A plan for the introduction of new production capacities and a plan for the introduction of basic capital are worked out with a view to tying in the capital works plan with production needs.

The plans for the introduction of production capacities and basic capital are drawn up on the basis of the production capacity

inventories in individual industries. These inventories show the production capacity available as of the beginning of the plan year and defined on the basis of progressive labor methods, and the planned accretion of productive capacity for the year through new construction as well as through the improvement of technological processes.

All the available possibilities for increasing production by a better utilization of the productive capacity of the existing enterprises are brought out and defined while working out the production capacity plan. The huge production funds created by the efforts of the Soviet people make it possible to sharply reduce the capital investments required to maintain the necessary increase in production even when the capacity-utilization factor shows a relatively small increase.

In his report to the Nineteenth CP Congress, M. Z. Saburov pointed out that in certain branches of the industry the capacity of enterprises had been reduced. "The State Planning Commission of the USSR," M. Z. Saburov said, "must improve its efforts to find new productive capacities and use them for filling state orders and wage a determined struggle against all sorts of narrow departmental tendencies to reduce the production plans."

A better utilization of the existing productive capacities in the Fifth Five-Year Plan was expected to produce about 30% of the entire five-year increment of pig iron smelting in 1955, about 25% of the entire increase in coal extraction, and about 30% of the increase in cement production.

As a result of the struggle to fulfill the Fifth Five-Year Plan for ferrous metallurgical production in 1951-1954, the

utilization of available inner reserves by the operating enterprises made it possible to produce an additional 4 million t of pig iron a year, more than 6 million t of steel and almost 6 million t of rolled metal.

Let us consider the state of productive capacity in the hypothetical case of the enterprises producing commodity A. The following data are used as a point of departure: (1) current year production 13 million t, planned for next year 16 million t; (2) annual productive capacity of enterprises making commodity A as of 1 January of current year 16.3 million t, capacity increment achieved by improving technology in current year 0.4 million t and by introducing new productive capacity in current year 2 million t; (3) capacity increment expected to be achieved by the introduction of improved technological processes during the plan year is about one million t; (4) no capacity decrease in the current or plan year; (5) new plants and technological improvements introduced at various periods during the current and plan year account for 0.33 of the annual working period; in other words, the average factor of recalculating the entire annual capacity increment into an average annual capacity increment, based on new construction and improved technology, equals 0.33.

Under these conditions, the productive capacity under the plan, as applied to commodity A (in millions of tons), may be presented as follows.

| Capacity<br>at Begin-<br>ning of<br>Year                                  | Capacity<br>Increment<br>Achieved<br>by Im-<br>provements<br>in Exist-<br>ing Enter-<br>prises | Capacity<br>Increment<br>Achieved<br>by Adding<br>New Basic<br>Capital | Capacity<br>Reduction | Capacity<br>at Year's<br>End | For Reference Purposes |                    |                                   |      |
|---|--|--|-----------------------|------------------------------|------------------------|--------------------|-----------------------------------|------|
|   |  |  |                       |                              | Average<br>Production  | Annual<br>Capacity | Capacity<br>Utilisation<br>Factor |      |
| 1   | 2  | 3  | 4                     | 5                            | 6                      | 7                  | 8                                 | 9    |
| 1. Current year   | 16.3   | 0.4  | 2.0                   | --                           | 18.7                   | 13.0               | 17.1                              | 0.76 |
| 2. Plan year:   |  |  |                       |                              |                        |                    |                                   |      |
| (a) with an invariable<br>capacity utilisa-<br>tion factor                | 18.7   | 1.0  | 6.0                   | --                           | 25.7                   | 16.0               | 21.0                              | 0.76 |
| (b) capacity utilisa-<br>tion factor in-<br>creasing from<br>0.76 to 0.80 | 18.7   | 1.0  | 3.0                   | --                           | 22.7                   | 16.0               | 20.0                              | 0.80 |

Column 4, "Capacity Increment Achieved by Adding New Basic Capital," is dependent on the rest of the indicators in the table. In this case, given the above-indicated factor of 0.33 and assuming that no capacity reduction took place, such dependence is expressed in the following formula:

$$\text{Col 4} = (\text{col 7} + \text{col 9} - \text{col 2} - \text{col 3} \times 0.33) + 0.33$$

As may be seen from the above table, it took only a 4 decimal-point increase in the utilization of productive capacities during the plan year to reduce the necessity for introducing new capacities by 1/2, from 6 million t to 3 million t.

The improvement of productive capacity utilization at the existing enterprises is achieved through technical progress, rationalization of production, mass inventiveness, and socialist competition; it also makes it possible to attain the desired rates of production expansion with a considerably smaller volume of capital investments.

The establishment of planned progressive norms of productive capacity utilization at the operating enterprises calls for a thorough study of the advanced methods employed by the best enterprises for introducing advanced machinery and technology, and a definition of the concrete measures required for improving the capacity utilization factor.

The 0.33 factor produced by recalculating the capacity of new enterprises into average annual capacity was used in the above example to simplify it. A speed up of construction, however, would increase that factor and thereby also reduce the dependence of production expansion on added capacity.

Indeed, if we were to raise the above factor in our example to 0.5, the planned volume of construction would require 1.6 million t of new productive capacity instead of 3 million t. If the introduction of new capacities continued at the 3-million-t level, it would be possible to increase the commodity output by 0.56 million t.

Thus the coordination of the construction program with the production plan calls for the fullest exploitation of all possibilities both in the utilization of available capacities and in speeding up construction work.

The available productive capacities of the enterprises of given industry during the plan year make it possible to coordinate the production plan only with the part of the capital works volume applying to the new projects commissioned during the same year. Serving as a basis for the planning of current stockpiles in the construction industry is the production capacity of the industry's enterprises during the coming years covered by the perspective plans for production development. The combined total of these productive capacities makes it possible to determine the productive capacity of the enterprises to be commissioned during a given year and the stockpiles to be accumulated for future use with a view to solving the current economic and political problems of national economic development. These figures and the degree of completion of the projects under construction in the current year, as well as the completed estimates on new construction projects serve as a basis for making up the title lists. Coordinated with the available production capacity, the title lists reflect the rate of the growing productive capacity of every industry required by expanded socialist reproduction in conformity with the basic economic and political problems of the plan year and future years.

The title lists of above-limit construction and the investments in below-limit construction, in turn, determine the necessary volume of capital investments within the estimated costs.

Thus the calculation of productive capacity, based on progressive norms of equipment utilization and the possibilities for speeding up the introduction of new productive capacity, is the foundation of the entire capital works plan. These productive capacities serve to tie in the construction program with the principal part of the national economic plan, the production plan. This brings up the problem of improving the methodology of calculating productive capacity by the use of 3 principal methods:

First, by the correct definition of the production capacity itself and by taking into account all the possibilities for increasing capacity revealed by leading production workers; by taking into account the capacity increment achieved not only by new construction and expansion, but also by improving the technological processes at the existing enterprises;

Second, by planning the maximum capacity utilization, establishing well-grounded progressive norms of equipment utilization and defining the concrete measures required to insure a rising norm of equipment utilization;

Third, by making provisions in the plan for possible reductions of construction periods.

The calculation of the productive capacity of individual industries has certain peculiar characteristics.

The industries producing a large variety of commodities (the machine building, food and light industries, etc) cannot define

their productive capacity in summary form. Their statement of production capacity, however, is drawn up on the basis of their most important types of commodities approved in the production plan. The distinctive feature of the productive capacity of power plants is that the stated capacity volume itself contains capacity reserves which do not figure in the production program. The power production industry must have a large reserve of capacity ready for immediate use in the event of an unforeseen demand for more power. The only possible solution of the reserve problem under the present technological situation, which does not permit the "storing up" of electric power, is to create substantial reserves of productive capacities.

A decision of the Eighteenth CP Congress provided for the creation of a permanent reserve of power-production capacity of 10-15% in the industrial areas. In its directives on the Fifth Five-Year Plan for the development of the USSR in 1951-1955, the Nineteenth CP Congress re-emphasized the importance of that problem and established the following policy in power production:

"In the field of electrification, a rapid increase in the capacity of power plants should be assured to meet the growing demands of the national economy and the daily requirements of the population in electric power, and increasing the available reserves in the power networks."

The July plenum of the TsK KPSS (1955) decided "to implement the construction of power plants and networks on a scale necessary to assure a more rapid development of power-producing capacity than that of the entire national economy."

Thus the planned productive capacity of the power plants must reflect the most rapid expansion of power-producing capacity not only for the purpose of supplying power to the national economy but also for the purpose of creating the necessary capacity reserves of the power plants.

The problem of creating or maintaining definite capacity reserves also applies to several other industries. Thus, for example, the planning of railroad construction takes into account the necessity for a certain reserve of traffic capacity.

In planning productive capacities for sugar refining plants, fish-processing plants, transportation facilities in agriculture, etc, provisions are made for adequate reserve capacities to take care of the seasonal spurt in production.

For certain types of commodities, the combined volume of productive capacity applicable to a particular product as a whole is inadequate for coordinating capital construction with the production program. Thus, for example, the capacity for the production of rolled metal cannot be determined until the capacity for the production of every design of rolled metal has been established.

A defined volume of productive capacity, as has already been mentioned, facilitates the coordination of the capital works plan with the production program in various branches of production.

The capital works plan in the unproductive field is built on the basis of its tie-up with the planned expansion of housing facilities, public utility institutions, the network of schools, hospitals, health resorts, etc.

The initial data required for such coordination are:

1. Basic capital in operation as of the beginning of plan period;
2. Norms of insuring appropriate funds for the population: housing norms expressed in square meters per person; water consumption norms reckoned in terms of 1,000 people a year; number of hospital beds per each 10,000 people, etc.

Actually, the balance method of calculation is applied here too, but there is one very substantial methodological difference -- while the coordination between capital construction and social needs within the framework of productive capacity calls for the maximum utilization of the existing production sites, the basis for coordinating capital construction with social needs within the framework of housing, school facilities, etc, is the expansion of floor space with a view to creating the most favorable cultural and living conditions for the working people.

Production capacity and unproductive basic capital serve as a basis for planning capital construction and commissioning new projects designed to serve the needs of the national economy.

The planning of individual projects has come to be expressed in the form of title lists.

Title lists of capital construction represent the most concrete portion of capital works.

Special tables of the national economic plan, referred to as title lists, contain a listing of all construction projects whose cost equals or exceeds the limits fixed by the government for the

various branches of the national economy, that is a listing of all above-limit construction projects.

All the most important construction indexes are approved in the title list for every above-limit construction project.

The title lists of the annual capital works plan contain the following indicators (see table on page 80; figures are conditional).

The list of titles of above-limit construction are made up separately for each ministry and department.

The determining factor in the compilation of title lists are the national economy requirements for new productive capacity to be introduced during the plan year and the following years, requirements brought to light by defining the volume of productive capacity. It is important that the title list provide for the systematic quarterly introduction of new capacities so as to keep in step with the necessary increase in the average annual productive capacity as well as with the introduction of new capacities in the allied branches of production.

In the hypothetical example under consideration the introduction of new productive capacity amounting to 3 million t is in keeping with the requirements of the known volume of productive capacity. This presupposes that the capacities for producing commodity A are concentrated in one ministry. In most cases it is not so, and the productive capacities are provided for not in one but in several title lists. For instance, the coordination of anything with the capacity for coal extraction calls for the figures contained in the title lists of not only the Ministry of the Coal Industry USSR but also of the ministries of local fuel industry, etc.

Consequently, from the viewpoint of national economic requirements, the title lists should be made up so that the introduction of new capacities in the current year (col 10) and the periods in which they are commissioned (col 12) should produce the necessary expansion of productive capacity, through capital construction, during each quarter of the year. To assure the solution of the perspective problems of national economic development, we must see to it that the planned full capacity of the projects under construction (col 3) -- taking into account the year construction began and the year it is to be completed (col 2) -- is up to the required prospective capacity expansion.

In our example, the enterprises whose construction is planned to begin next year (No 6, 7, 8, 9, and 10) will have a combined rated capacity of 5 million t. Only one of them (No 10) has been under construction since last year, the others are to be started in the plan year.

TITLE LIST OF CAPITAL CONSTRUCTION FOR 1955

Ministry.....

| No                                 | Year    | Rated capacity of entire project (in mill tons) | Estimated cost of project under construction (in mill rubles) | Completed since beginning of construction up to plan year |   |  |                                    | Plan year  |  |  |    | Technical document -<br>cation, by whom<br>and when approved | Name of organization carrying out<br>the construction |
|------------------------------------|---------|---|---|---|---|--|------------------------------------|--|--|--|----|--|---|
|                                    |         |   |   | Estimated cost of capital works (in mill rubles)          | Including the year preceding the plan year (in mill rubles) | New capacity for commodity A production (in mill tons) | New basic capital (in mill rubles) | Estimated cost of capital works (in mill rubles) | New capacity for commodity A production (in mill tons) | New productive capacities commissioned (quarterly) |    |  |   |
| 1                                  | 1954-55 | 0.5   | 200   | 100   | 100   | --   | --                                 | 100  | 0.5  | 200  | II |  |   |
| 2                                  | 1954-55 | 1.0   | 400   | 300   | 200   | --   | 50                                 | 100  | 1.0  | 350  | IV |  |   |
| 3                                  | 1954-55 | 1.0   | 400   | 350   | 250   | --   | --                                 | 50   | 1.0  | 300  | II |  |   |
| 4                                  | 1955    | 0.25  | 100   | --  | --  | --   | 100                                | 100  | 0.25   | 100  | IV |  |   |
| 5                                  | 1955    | 0.25  | 100   | --  | --  | --   | --                                 | 100  | 0.25   | 100  | IV |  |   |
| 6                                  | 1955-56 | 0.5   | 200   | --  | --  | --   | --                                 | 150  | --   | 50   |    |  |   |
| 7                                  | 1955-56 | 1.0   | 400   | --  | --  | --   | --                                 | 350  | --   | 150  |    |  |   |
| 8                                  | 1955-56 | 1.0   | 400   | --  | --  | --   | --                                 | 250  | --   | 100  |    |  |   |
| 9                                  | 1955-56 | 1.0   | 400   | --  | --  | --   | --                                 | 300  | --   | 50   |    |  |   |
| 10                                 | 1954-56 | 1.5   | 600   | 150   | 150   | --   | 50                                 | 300  | --   | 50   |    |  |   |
| Total for above-limit construction |         | 8.0   | 3,200   | 900   | 600   | --   | 200                                | 1,800  | 3.0  | 1,450  |    |  |   |
| Below-limit investments            |         | --  | --  | --  | --  | --   | --                                 | 200  | --   | 200  |    |  |   |
| Total                              |         | --  | --  | --  | --  | --   | --                                 | 2,000  | 3.0  | 1,650  |    |  |   |

The title list of construction by the ministries, departments, and councils of ministers of the union republics is substantiated in much greater detail. Methodologically, the compilation of the title list by a ministry is not different from its compilation by the state central planning bodies. For the ministry, however, it is very important, first, to know the limit of capital investments which provide for a definite state-approved ceiling of capital investments and consequently also for the title list. Secondly, the desired volume of productive capacity can be built by the ministry only on the basis of a definite, state-approved volume of production for the plan year and (in approximate figures) for a number of years to follow.

The ministry, on the other hand, compiles and approves the title lists covering the entire volume of its capital investments, that is, it also distributes under appropriate titles the below-limit capital investments approved for every ministry in a lump sum. Besides, the ministry and its main administrations approve -- in regard to both above-limit and below-limit construction items in the title list -- all the auxiliary title lists for individual construction projects, that is the title lists of completed portions of any particular item, such as individual buildings, parts of a building, drive ways, foundations, dams, etc. Auxiliary title lists are very important for proper organization of construction and for controlling the implementation of the capital works plan.

A combined plan for introducing new productive capacity and basic capital is drafted on the basis of the title lists if such lists are fully coordinated with the productive capacity volume.

The plan for the introduction of new productive capacities is approved, within the national economic plan, in terms of the most important types of commodities to be affected by the added productive capacity. The new productive capacity to be added for each of the mentioned commodities is fixed for each ministry, department, and councils of ministers of the union republics.

The combined plan for the introduction of new productive capacities determines separately: (a) the introduction of new capacities by building new enterprises and rebuilding and expanding existing ones; (b) the exploitation of additional productive capacity at the existing enterprises by mechanizing and intensifying production, improving the technological process, replacing or installing new equipment, rebuilding the existing heavy machinery and other organizational and technical measures.

The plan to introduce new basic capital is set up for every ministry, department, and the councils of ministers of the union republics as a whole without specifying such basic capital in connection with individual construction projects. Column 11 of the title list, "Introduction of Basic Capital," is merely used to calculate and substantiate the total volume of basic capital planned to be commissioned. Column 11 is now excluded from the established title lists. The distribution of added basic capital among different projects does not have to be approved in the state plan. There is no need to commit a ministry to a previously-fixed method of distributing new basic capital among different projects. From the national economic point of view it is important that a given volume of capital investments produce a definite increment of basic capital as a whole so that the volume of uncompleted construction could

thereby be held within definite limits. As for commissioning new projects, it is important that the volume and periods of introduction of new capacities, rather than of new basic capital, be established for them -- and that is reflected in the approved title lists.

The title lists of capital investments are used as a basis for defining the balance of basic capital, one of the most important integral parts of the national economic balance.

#### GENERAL ASPECT OF THE BASIC CAPITAL BALANCE

| Ministries<br>and depart-<br>ments | Basic capital<br>at beginning<br>of year | Introduction<br>of basic<br>capital | Decommis-<br>sioned basic<br>capital | Basic capi-<br>tal at<br>year's end |
|------------------------------------|--|-------------------------------------|--------------------------------------|-------------------------------------|
| 1                                  | 2  | 3                                   | 4                                    | 5                                   |

The balance of basic capital makes it possible to analyze the expansion rate of basic capital as a whole by social sectors and industries and to differentiate between productive and unproductive basic capital.

The figures contained in the balance are used also for determining the annual average of available basic capital. A comparison between the dynamics of basic productive capital and the dynamics of production, as was shown above, is necessary for analyzing the efficiency of basic capital utilization. The balance of basic capital is also important for analyzing the correlation between the ordinary reproduction and expansion of basic capital (considering the cost of capital repairs).

Very important for an analysis of the capital works plan as a whole, in addition to the basic capital balance, is the balance of uncompleted capital works which looks like the following:

| Ministries<br>and depart-<br>ments | Unfinished<br>capital<br>works at<br>beginning<br>of year | Capital<br>work done<br>during<br>the year | Introduc-<br>tion of<br>basic<br>capital | increasing<br>the cost<br>of basic<br>capital | Unfinished<br>capital<br>works at<br>year's end |
|------------------------------------|---|--|--|---|---|
|                                    | 1   | 2  | 3  | 4   | 5   |

Col 6 = col 2 + col 3 - col 4 - col 5

Within certain limits, the above 2 balances are also practically important for an analysis of the capital works plan in different ministries. The title lists, in particular, make it possible not only to break down the total volume of capital investments into completed and unfinished capital works for different ministries, but also to analyze the current material stockpile and its possible immediate utilization by ministries and industries.

The improvement of the planning of a current material stockpile in capital construction calls for more attention to the balances of unfinished capital investments.

Attention is called to the inadequate use made of the basic capital balance and the balance of unfinished capital investments (with the exception of a very general calculation of balances) for planning purposes. This is not necessarily because they are not required for drafting the national economic plan. The point is that the problem of reevaluating the basic capital (commissioned and unfinished) according to the existing estimated cost has not yet been solved. The lack of such a solution compels us to resort to approximate estimates (with the aid of average indexes, etc) which tend to diminish the value of any conclusion that may be made from a more or less detailed analysis of the balances under consideration.

Title lists are used, further, for determining the breakdown of the capital investment volume into capital investments in new construction and capital investments in the expansion and reconstruction of existing basic capital. An analysis of this investment structure with reference to individual ministries is particularly important since the expansion and reconstruction of existing enterprises permits a more rapid increase in productive capacity at less cost.

The choice between the construction of a new enterprise and the expansion of an old one cannot, of course, be determined by the cost per unit of capacity. Such a choice can be made only when all the elements determining the efficiency of capital investments are considered.

The title lists include both the construction projects begun last year and those beginning now.

The problem of choosing between a new construction project and the expansion of existing basic capital is exceptionally complicated. It combines such questions as the rational distribution of construction, the concentration of facilities on enterprises to be commissioned (puskoviye), and other very important constructions and projects, the creation of a current material stockpile in capital construction, and the improvement of the efficiency of capital investments. Precisely the choice of the particular construction to be undertaken reflects the solution of these questions.

All the required estimates and figures on the new construction must be available before it can be included in the title list. It is forbidden to finance and include in the plan construction

projects for which no such documentation is available. Hence the problem of well thought out scientific planning for research and other projects to be constructed in future years. The projects under construction in the current year should also be used for preparing the necessary blueprints and estimates of the construction projects to be included in the title list in the year after the plan year. The master plans of the projects organizations, subject to government approval (since 1950), provide for both new projects to be constructed in the current year and research and other projects scheduled for construction in coming years.

The project-estimating documentation consists of documents covering the 3 project-planning stages: (1) the project assignment and its estimated cost; (2) the technical project and the estimate of its over-all cost; (3) the blueprints on the construction site.

The project assignment includes all the basic elements characterizing future construction: the construction site, the type of commodities to be produced by the future enterprise, the productive capacity, the functional connection of the enterprise with the other enterprises and industries of the national economy, raw material and fuel sources, possible supplies of water and electric power, the principal types of buildings and installations, housing construction, and the periods and stages of construction.

The project assignments not approved by 1 October of the preceding year cannot be included in the annual title list of capital construction. The project assignment, however, can be included in the title list even if the technical project has not yet been worked out. But the work permitted on such construction during the plan year is only preliminary and preparatory work, such as the

preparation of the ground, the acquisition of building mechanisms and transportation facilities, the procurement of construction materials, the construction of railroad spur lines and quarries.

Formerly the project assignments and technical projects of all types of construction had to be approved by the appropriate ministries. At present any project assignment whose estimated cost is above the government-fixed figures must be approved by the Council of Ministers USSR. Other projects and the estimates of their costs are approved by the ministries and departments.

Technical projects and estimates are approved by the ministries and departments. An exception are the very large construction projects as well as the construction of new-industry enterprises, regardless of their cost, whose technical aspect is approved by the Council of Ministers USSR. Important in preparing the right projects and estimates is the state committee on construction under the Council of Ministers USSR.

The project-estimating documentation is used as a basis for including in the title lists the new projects which, when combined with the construction begun in the preceding year, produce the necessary capacity increment during the plan year and the necessary material stockpile for the future. The project-estimating documentation also determines the estimated cost of the planned construction.

The bases for determining the estimated cost of the current-year capital investments in every construction project entered in the title list are: (a) the approved estimates or financial calculations of estimated costs; (b) the utilization of part of the

estimated costs (for construction continued from last year); and (c) construction periods. These data determine the volume of above-limit capital construction for different ministries as well as for the national economy as a whole. To this should be added the budget figures on below-limit construction and the principal purposes for which it is designed. The total of above-limit and below-limit construction represents the entire volume of state capital investments in the estimated construction costs (in our example it is 2 billion rubles).

The estimated cost of the entire annual volume of capital works thus consists of the cost of the different construction projects during a given year. Consequently the problem of reducing construction costs must be decided when the estimates of the cost of individual construction projects to be included in the title list are made.

What is the estimated cost of construction based on?

A cost estimate is made on the basis of the technical project, approved consolidated estimate norms and approved price indicators.

In a technical project provisions are made for the construction and technical characteristics of any one object of construction; this is further used as a basis for establishing the nature and quantity of the various so-called construction elements or types of work ( $m^3$  foundations,  $m^3$  earth-moving jobs,  $m^2$  plastering jobs, etc). The expenditure of materials, working time, and machine shifts on each construction element is computed on the basis of the manual listing the consolidated estimate norms. Finally, the

approved price indicators and price lists make it possible to include the established cost of materials, working time and machine shifts in the estimated costs.

Established on the basis of the technical project, consolidated norms and price indicators, is a so-called breakdown estimate of a particular construction project representing the estimated cost of each construction element based on the approved norms and prices as applied to the particular construction project.

Thus the title lists of capital construction are made up on the basis of the project-estimating documentation prepared beforehand.

Supposing that the balance sheet of a certain industry's productive capacity calls for the introduction of new enterprises during the plan year with a total productive capacity of 3 million t of commodities. Supposing it is also necessary to create a material reserve in the construction of enterprises of a total capacity of 5 million t; the enterprises accounting for 4 of these 5 million t are to go into operation next year, and the rest (totalling one million t) are scheduled to be commissioned one year after the plan year.

Moreover a definite portion of the new productive capacities introduced during the plan year is found to be short of the necessary material reserve carried over from last year to the extent of 0.5 million t. That portion must be made up, say, by delaying the construction of small enterprises which can be started and completed in less than one year.

In this case, although the new productive capacities introduced during the year amount to only 3 million t, the new construction projects to be selected for inclusion in the title list should have a total productive capacity of 5.5 million t.

The drawing up of construction projects and their approval precede the drafting of the plan which is based on such projects. For this reason, the methods of compiling a title list should be governed by the project-estimating documentation since the same practice is used also in plan drafting. This, of course, does not preclude the possibility of eliminating from the plan any particular project which had been worked out, for example, without taking into account the latest technological advance that may improve the development of the planned industry. Such a project will either be substantially changed or replaced by a new one.

With an adequate number of project assignments and technical projects on hand, it should not be difficult to select a certain number of construction projects with a total productive capacity of 5.5 million t, as shown in our example. But the problem is that the selection of a project must also meet several other requirements.

Of these the following are the most important:

1. The projects must meet the highest requirements of advanced technology. One of the most important indicators of that is the production cost level of the future enterprises.
2. The projects selected to be commissioned at certain time intervals (at least quarterly) should be in keeping with the national economic requirements for the development of production in the particular industry in the next few years; these projects should also not exceed the given limit of capital investments.

3. The distribution of the planned projects must be in keeping with the planned changes and distribution of production within the next few years.

4. The beginning and duration of the construction of the different projects should be planned so as to prevent the dispersal of funds among numerous projects which is conducive to higher costs and slower construction.

In his speech to the All-Union Conference of Builders in 1954, N. S. Khrushchev cited a striking example of the harmful effect of scattering funds to many projects. The Ministry of Railroads, he said, has been building the Askiz-Abaza railroad line since 1940. The cost of that construction project is 74 million rubles. Sixty-four percent of that amount has been spent in the last 13 years. Five million rubles are scheduled to be spent in 1955. With this kind of planning the railroad construction will last 19 years.

The right selection of construction projects as well as the improvement in the planning of such projects are closely related to the problem of the efficiency of capital investments. This problem is the object of special consideration and research work. However even the brief list of requirements to be met by the selection of new construction projects shows that the national economic efficiency of capital investments cannot be judged by any one isolated indicator. The economic efficiency of capital investments in a socialist national economy can be determined only by the degree of their conformity to all the above-listed requirements to be met in the selection of construction projects. The planning of a single project in a given area should be governed by considerations of the highest possible economy in the exploitation of the future project

as well as in its construction. But the problem of the economic efficiency of capital investments cannot be reduced to the problem of the most successful selection of a project from the point of view of the profitable operations of the future enterprise. The selection of projects is an extremely complicated job. It may be found, for example, that the construction of project A -- which is better than project B from the point of view of the future enterprise's profitable operations -- will take 2-3 times as long as the construction of project B. This situation, assuming that the commodity involved is in great demand, may force the concentration of effort on project B.

J. V. Stalin pointed out that important as the profitable operations of individual enterprises and industries may be, if they are considered ". . . from the viewpoint of the entire national economy over a period of, say, 10-15 years -- which is the only correct way of approaching that problem -- the temporary and precarious profitability of single enterprises or industries would stand no comparison with the higher form of reliable and permanent profit level made possible by the operation of the law of systematic development of the national economy and by the planning of the national economy; the latter also preclude us from periodic economic depressions which ruin the national economy and inflict colossal material losses on the people, and insure an uninterrupted expansion of the national economy at a high tempo" (J. V. Stalin, Ekonomecheskiye problemy sotsializma v SSSR [Economic Problems of Socialism in the USSR], pages 24-25).

This observation by J. V. Stalin is of great methodological significance for the planning of capital works. The problem of the

efficiency of capital investments planned for a particular period or for individual projects can be solved only under a thoroughly integrated system of national economy and from the perspective of several years.

Hence the enormous importance of prospective balance-sheets of productive capacities for planning new construction projects. The prospective balance sheets of productive capacities, in turn, cannot be drawn up without first defining the prospective development of the national economy in the next 5-10-15 years (in varying detail, of course). The first important prerequisite for the right selection of projects calls for drafting long range plans for the development of the technique and production technology of the individual branches of the national economy.

Thus the further improvement in planning capital investments is closely related to improving prospective planning.

Thus from the point of view of the national economy, the capital investments plan is designed to meet the following major requirements:

1. The coordination between the volume of capital works and the accumulated portion of the national income.
2. The establishment of the industrial structure of the capital investments in conformity with the economic and political problems of the plan period.
3. The use of the balance-sheet of productive capacities as a basis for drawing up title lists of capital construction, plans for the introduction of new productive capacities and basic capital

and plans to create the necessary material stockpiles for construction by the industries, ministries, departments, and councils of ministers of the union republics.

The following are necessary for the successful realization of these plans:

1. Long range plans for the development of the entire national economy (in greater detail for the five-year plan, and in terms of the next 10-15 years as applied to the basic indicators).

2. Economical projects and estimates designed to meet the requirements for the continuous improvement of production on the basis of advanced technology. The process of substantiating the capital investments plan from the viewpoint of the national economic requirements tends to define the precise nature of the requirements themselves as well as the possibilities for meeting them. This also serves to gradually define and improve the balance-sheet of productive capacities, housing, social and cultural institutions, etc, and, immediately following that, also the title lists.

To substantiate the capital works plan, it is not enough to make certain that it meets the requirements of the national economy as a whole and is kept within the fixed limits of the capital investments volume.

The capital works plan makes its own claims on the various branches of the national economy, on the available labor force, and on the revenue and expenditures of the government and various organizations. Hence the necessity for making adequate material, labor, and financial provisions for the capital works plan.

CHAPTER IV. MAKING THE NECESSARY MATERIAL,  
LABOR AND FINANCIAL PROVISIONS FOR THE CAPITAL WORKS PLAN

It was ascertained in the preceding chapter that the accumulated portion of the national income determines both the necessary and possible volume of capital investments and the material production it requires. However, the specific equipment requirements for capital construction -- that is special types of equipment for the construction projects to be commissioned during the plan year -- as well as the concrete requirements of construction materials, labor, and financial resources are not reflected in the over-all coordination between the volume of capital investments and the national income. Providing the capital works plan with the necessary material, labor and financial resources means establishing within the plan concrete proportions between the development of the production of different types of commodities and the requirements of capital construction; between the training of professional, engineering, and technical workers for construction and the need for such cadres by the construction organizations in connection with a given construction program; between the financial resources which can be used for capital construction and the required financing of capital works.

The problem, however, is not exhausted by the mere procurement of the necessary resources for the planned volume of capital works. The problem is to insure the most economical expenditure of these resources.

The less the need for material, labor, and, therefore also, financial resources for a given volume of capital investments, the greater the possibilities for increasing the capital investment volume itself.

The provision of all the necessary types of resources for the capital works plan, therefore, is subordinated to promoting the expansion of the national income by improving in every way the capital construction on the basis of advanced technology.

What does that improvement consist of?

First, it consists of an economy in the use of material resources in construction; second, an increase in the construction workers' output; third, a reduction in the cost of construction and installation work.

While from the viewpoint of the national economic requirements the capital works plan is based on the balance sheet of productive capacity, the procurement of the necessary resources for the capital works plan is based on the use of the following: available equipment, rolled ferrous metals, commercial lumber, saw timber and wall-building materials; available labor and trained cadres; the balance sheet of revenues and expenditures of the combined financial plan.

In addition to other requisitions, these balance-sheets contain special accounts of the resources required for the planned volume of construction and installation work, and the balance sheets of equipment contain also a special account of equipment needs and acquisitions.

The demands of the plan for construction and installation work are determined on the basis of the planned improvement in the utilization of material, labor and financial resources for construction purposes made possible by advanced technology.

The equipment balance sheets are drawn up to include a large nomenclature of various types of machines, implements, and mechanisms.

The demand of capital construction for a particular type of equipment is indicated separately (a) for construction projects to be commissioned and (b) for the replacement of outworn equipment.

Although equipment is, as a rule, designed for use by a particular industry, the demand for many types of equipment (for example, machine tools and motor vehicles) is normally made by various industries and departments.

The factors determining the demand for equipment that does not require installation are: the volume of work to be performed by that particular type of equipment during the year; the progressive production norms per unit of equipment; the equipment available at the beginning of the year; the possible additions of new equipment determining the average annual capacity that may be utilized in a given year; the time intervals at which old equipment is decommissioned during the year. Different balance-sheets of equipment are helpful in determining and meeting the requirements for capital investments.

Thus, for example, the information required for determining the need for tractors (reckoned in 15 hp units) in agriculture consists of: the number of tractors available on the first of the year; the number of tractors taken out of work (according to the time intervals) during the year; the volume of tractor work to be done during the plan year (in fresh-plowed hectares), including the busiest season; the output per tractor in a year and in one shift

(in fresh-plowed hectares); number of shifts worked during the busiest season.

For this it is important to take account of the seasonal nature of various types of work. The demand for agricultural machines must be based also on the necessary number of machine-shifts during the busiest season.

The work load to be carried by the tractor pool of the machine-tractor stations is becoming more evenly distributed in view of the mechanization of agricultural work, the improvement in farming and stock-raising technique, and particularly since agriculture is becoming increasingly diversified and specialized. But the problem of reducing the planting and harvest-gathering periods makes it incumbent upon the machine-tractor station to have more tractors and other machinery on hand during those periods than at any other time. This should be considered when drawing up a balance sheet of the available tractors, and particularly such implements as combines and other harvesting machines.

Thus in the balance sheets of equipment not requiring installations, the progressive utilization norms are listed as equipment needs. For equipment requiring installation, the resources required for the capital investment plan are determined (a) for construction to be completed -- according to the enterprises under construction, and (b) for the replacement of worn out equipment -- according to special certificates confirming the need for such replacement.

The progressive norms of equipment utilization are reflected in these balance sheets not directly but through the balances of

productive capacity. If, for example, the available metal-rolling equipment proves inadequate to meet the requirements of the planned rolling-mill construction, it produces a deficit in the production capacity for rolled metal. Such a deficit can be liquidated by a possible improvement of the utilization factor of rolling mills in production. This, in turn, will mean a smaller demand for capital investments in connection with rolled metal production and, particularly, a smaller demand for rolling equipment.

One serious problem is to make certain that construction projects are completed on scheduled time. In several cases the commissioning of completed enterprises is delayed because the equipment is not received on time and is not complete. Such occurrences should be prevented by the ministries requisitioning the equipment, by the central planning organizations which work out the plans for equipment distribution, and by the supply and marketing organizations which actually provide the equipment for the construction projects.

The central problem of equipment planning is to exert an active influence on the production program of the machine-building industry with a view to the maximum possible improvement of the constructional and operational qualities of the machines and other implements of production. In regard to the equipment requiring installation, this problem is solved primarily in the prospective balance sheets.

In the annual plans, the quantity and composition of the equipment is mostly predetermined by plans for construction projects. If such plans become outdated, however, they should be redrafted and improved.

Even for construction projects begun in past years and scheduled to be put into operation in the near future it is frequently possible to install new and better equipment than the kind called for by the plans. This may prove expedient even if such changes require additional expenditures for construction and installation work.

The balance sheet of available road-building machines occupies a special place in the capital works plan. These balance sheets are used as a basis for both the capital works plan, as it applies to the acquisition of equipment not requiring installation, and the capital works plan of the entire national economy as it applies to construction and installation work.

In addition to the physical volume of various types of equipment, the combined volume of available products of the machine-building and metal-processing industries expressed in financial terms, plays an important part in planning the capital works plan.

The combined volume of the products of the machine-building and metal-processing industries is distributed according to the following needs: for the capital investment plan; for intraindustry cooperation purposes; for the general market; for defense purposes; for repairs (spare parts); for an increment of unfinished production.

The importance of this type of balance-sheet is explained first by the fact that it is impossible to determine the available volume of every type of equipment included in the capital investment plan. The combined balance sheet of the available products of

the machine-building and metal-processing industries shows to what extent the capital investment plan as a whole has been provided with the necessary resources. Secondly, the allocation of machine-building products for needs of the capital investment plan makes it possible to define the precise structure of the latter and thereby also the volume of construction and installation works.

Making the necessary material, labor, and financial provisions for the capital works plan requires, first of all, that a definite part of the total capital investment be set aside for the planned volume of construction and installation work reckoned in prevailing costs.

At first glance it would appear that making allocations for construction and installation work presents no difficulties, since such allocations are provided for in the plans and estimates of the different construction projects. Actually, however, this holds true for only the few projects the construction of which is begun and completed within the plan year. The overwhelming majority of construction projects and title lists for the plan year are either carried over from the previous or carried into the next year, or both.

This problem is much simpler in the prospective plans since the construction carryover is much smaller in relation to the capital investment volume of the five-year plan than it is in comparison with the annual plan. But in the prospective plans, too, particular attention is paid to the level of development planned for the final year of those plans. For this reason the same problem of determining the exact volume of construction and installation work, assuming a large construction carryover from previous years, acquires particular importance for the final year of the prospective plan.

Consequently the difficulty of making allocations for construction and installation work is due to the lengthy construction cycle and consists in the fact that in most cases the allocations for construction and installation work must be made not from the total appropriations but from the appropriations applying to the current plan year. Would it not be possible to fix the relative volume of construction and installation work to fit into the mentioned portion of appropriations just as it is done for the total appropriations for the entire project? Let us assume that in our example (see title list, page 80) the capital investment to be made in project No 1 amounts to 100 million rubles which is 50% of the entire estimated cost of the project. If the sum appropriated for construction and installation work is 130 million rubles, the relative cost of such work will amount to 65% of the appropriation. Can it not be assumed that an appropriation of 100 million rubles would include a corresponding volume of construction and installation work which would amount to 65 million rubles in the plan year (65% of 100 million rubles)?

In the great majority of cases such an assumption would be wrong. The 100 million ruble capital investment fixed for the plan year by its very nature differs very much from the 100 million rubles invested during the last year. Last year construction is contingent primarily upon the investment in equipment. If the cost of equipment in this case amounts to 60%, that is 60 million rubles, plus some miscellaneous expenditures, the amount left for construction and installation work will not exceed 35-40 million rubles.

Since the structure of capital investments changes at different stages of the construction of the same project, the most

precise definition of the volume of construction and installation work within the limits of the appropriations can be made only by an analysis of the project and the appropriations themselves. It is necessary to earmark the part of the appropriation for each project to be spent during the year under consideration and to analyze its structure.

This method of calculation is both feasible and compulsory for single construction projects and the construction of a trust. But such an analysis of the structure of different parts of construction projects by the central organs, particularly in the drafting of the entire state plan, is practical only for a limited number of very large capital construction projects.

True, some assistance in this respect is offered by the materials submitted by the ministries and departments which, in the final analysis, are based on the figures applying to single construction projects. But, in the first place, these materials require checking. We have not yet entirely eliminated the narrow-departmental approach to the business of planning on the part of certain economic leaders. And yet it is the construction volume and installation work that determines the amount of material funds to be allocated from a centralized source, the total payroll, etc. Add to this the fact that the construction organizations working on a contract basis are primarily responsible for the practical realization of the construction and installation work, and it will become clear why the ministries and departments frequently exaggerate the required volume of construction and installation work to be performed within a given limit of capital investments.

Secondly, the all-state planning organs as well as the ministries and departments begin to work on their plans long before they receive any information from the localities.

Thirdly, the planning work goes through several stages, the title lists undergo several changes and it is impossible to make local inquiries about the different variants of the lists.

Thus the problem of defining with adequate precision the volume of construction and installation work for the different ministries, departments, and councils of ministers of the union republics acquires a great national economic importance. The importance of this problem is increasing with the growing scale of construction.

As far back as 1953 the volume of construction and installation work was more than double that of 1940. In the first 4 years of the Fifth Five-Year Plan alone the volume of construction and installation work was increased by 50%.

A definition of the volume of construction and installation work for individual ministries and departments and for the national economy as a whole is possible also without a special examination of the plans and appropriations for individual construction projects. This can be done, first, on the basis of the statistics of the past years and, second, on the basis of the relative volume of construction and installation work within the construction appropriations for any particular industry. Using these figures, it is possible to define very precisely the relative volume of construction and installation work within the total capital investment volume by taking into account its relative volume in the past years

as well as its relative volume within the total appropriations.

What grounds are there for allowing this type of method for a ministry as a whole and not permitting it for individual construction projects? In our example, the relative volume of construction and installation work within the planned capital investments cannot be considered as identical with the relative volume of such work within the total volume of appropriated capital investments. The same applies to the construction carried over from last year. In the case of a ministry as a whole, however, a number of projects are being completed and others begun at the same time, and the projects under continued construction, from last year and into next year, are in various stages of completion (some projects as of the first of the year, others as of the year's end). It may be assumed roughly that since the construction projects are at different stages of completion, the relative volume of construction and installation work characteristic of the particular industry and supported by the statistical figures for previous years as well as by plan and appropriation figures is applicable to the mentioned construction projects taken as a whole.

Thus if, according to our example, the relative volume of construction and installation work characteristic of this particular industry is 65%, it cannot be applied for continued construction projects, as may be seen from the foregoing. But there are some grounds for applying this relative volume -- with a certain degree of proximity, of course -- to all the continuous construction projects taken as a whole.

Let us take the following example of an industry in which the relative volume of construction and installation work accounts for

about 2/3 of the appropriations for the construction of different projects:

| (in million rubles)                                 |                 |                                 |                      |                                     |                          |
|---|-----------------|---------------------------------|----------------------|-------------------------------------|--------------------------|
|   | Budgetary costs | Capital investments during year | % of budgetary costs | Construction and installation works | % of capital investments |
| <b>1. Construction carried over from last year:</b> |                 |                                 |                      |                                     |                          |
| A.  | 200             | 100                             | 50                   | 30                                  | 30                       |
| B.  | 400             | 100                             | 25                   | 20                                  | 20                       |
| C.  | 400             | 50                              | 12.5                 | 5                                   | 10                       |
| <b>Total</b>  | <b>1,000</b>    | <b>250</b>                      | <b>25</b>            | <b>55</b>                           | <b>22</b>                |
| <b>2. Construction carried over into next year:</b> |                 |                                 |                      |                                     |                          |
| D.  | 200             | 100                             | 50                   | 85                                  | 85                       |
| E.  | 400             | 300                             | 75                   | 250                                 | 83                       |
| F.  | 400             | 350                             | 87.5                 | 260                                 | 74                       |
| <b>Total</b>  | <b>1,000</b>    | <b>750</b>                      | <b>75</b>            | <b>595</b>                          | <b>79</b>                |
| <b>Grand total</b>                                  | <b>2,000</b>    | <b>1,000</b>                    | <b>50</b>            | <b>650</b>                          | <b>65</b>                |

With all the difference between the relative volumes of the construction and installation work of the 2 groups of construction projects, the average volume of construction and installation work amounts to 65%.

Under conditions of more or less even capacity accretion such a situation is quite natural. If the degree of completion of the construction projects continued from last year were 80%, it would then be necessary to maintain the same degree of completion for projects still under construction by the end of the plan year.

For many construction projects continued from last year and those carried into next year, the capital investments as a whole contain approximately as much investment in the last stages of construction as is required to complete the construction projects which will pass through the first stages of construction during the current year.

The rapid tempos of capital construction, however, call for substantial changes in such calculations. The assumption in our example is that the degree of construction completion is the same at the beginning and the end of the year (the budgetary cost of the projects under construction at the beginning and the end of the year is one billion rubles). As a rule, however, unfinished production tends to increase.

Let us see how this same calculation is made on the basis of the title list, used by us as a hypothetical example (see page 80), which envisages the possibility of increasing unfinished construction.

| (in million rubles)                                 |                 |                                 |                      |                                     |                          |  |
|---|-----------------|---------------------------------|----------------------|-------------------------------------|--------------------------|--|
|   | Budgetary costs | Capital investments during year | % of budgetary costs | Construction and installation works | % of capital investments |  |
| <b>1. Construction carried over from last year:</b> |                 |                                 |                      |                                     |                          |  |
| No 1  | 200             | 100                             | 50                   | 30                                  | 30                       |  |
| No 2  | 400             | 100                             | 25                   | 20                                  | 20                       |  |
| No 3  | 400             | 50                              | 12.5                 | 5                                   | 10                       |  |
| No 10   | 600             | 300                             | 50                   | 195                                 | 65                       |  |
|   | 1,600           | 550                             | 34                   | 250                                 | 45.5                     |  |

|   | <u>Budgetary costs</u> | <u>Capital investments during plan year</u> | <u>% of budgetary costs</u> | <u>Construction and installation works</u> | <u>% of capital investments</u> |
|---|------------------------|---|-----------------------------|--|---------------------------------|
| <b>2. Construction carried over into next year:</b>     |                        |   |                             |  |                                 |
| No 6  | 200                    | 150   | 75                          | 130  | 87                              |
| No 7  | 400                    | 350   | 87.5                        | 280  | 80                              |
| No 8  | 400                    | 250   | 62.5                        | 220  | 86                              |
| No 9  | 400                    | 300   | 75                          | 250  | 83                              |
| No 10   | 600                    | 300   | 50                          | 195  | 65                              |
|   | 2,000                  | 1,350                                       | 67.5                        | 1,075                                      | 80                              |
| <b>Total, minus the second listing of construction:</b> |                        |   |                             |  |                                 |
| No 10   | 3,000                  | 1,600                                       | 53.3                        | 1,130                                      | 70                              |

Construction project No 10 appears in both parts of the table since it has been continued since last year and will be carried into the next year. If it were not counted, the average ratio between the capital investments and the budgetary costs in the first group would be 25% (that is the percent of completion in the first group of construction projects on the first of the year was 75), and in the second group 75%. The sum total of these ratios is either close to 100% or equals 100% (if construction project No 10 is not counted).

In absolute terms, however, the degree of construction completion at the end of the year is considerably higher than on the first of the year. The budgetary cost of the products under construction at the beginning of the year was 1.6 billion rubles, and

by the end of the year it was 2 billion rubles. And although the percent of construction completed by the first of the year is close to that of the year end (especially if project No 10 is excluded), the relative volume of construction and installation work rose to an average of 70%. That means that using only the relative volume of construction and installation work within the appropriations (which in this case is approximately 65%) as a basis for calculations, could lead to grave mistakes.

It is the over-all result of the correlation between construction and installation work and capital investments that is shown by the statistical figures for a number of years; that result is affected also by the increase in completed construction.

However even the hypothetical examples cited above show that the application of the statistical figures to the plan year without substantial corrections is fraught with serious errors. It can be applied only for an approximate estimate.

What exactly are the corrections to be made in these calculations?

\* A study of the statistical figures makes it possible to establish the changes the relative volume of construction and installation work is undergoing at different stages of construction in the industry under consideration. Knowing these changes (and they are fairly typical for the industry under consideration), it is possible to introduce differentiated relative volumes of construction and installation work for each above-limit construction project. The title list contains a precise definition of the construction stage of each project (as it is reflected in the correlation between

the capital investment in the particular project over the entire past period and the budgetary cost of the project).

The consolidated accounts of the volume of construction and installation works play an exceptionally important part in national economic planning. It is therefore very important to improve them. At any rate, the consolidated accounts of the volume of construction and installation work must first be applied to individual industries and only then to the national economy as a whole. The point is that a change in the structure of capital investments has a telling effect on the relative volume of construction and installation work. Thus in 1945 the relative volume of construction and installation work in the ferrous metallurgical industry amounted to 75-77% of the appropriations, in the machine-building industry 50-55%, in the light industry 60-65%, and in housing construction 96-97%. With such differences between the relative volumes of construction and installation work of the various industries, any change in the industrial structure of the capital investments affects the average volume of construction and installation work of the national economy as a whole.

Thus, for example, the 1954 capital investments in the entire national economy were increased more than threefold compared to 1940, and the capital investments in housing construction during that same period were increased more than 6 times. The expanding relative volume of housing construction within the total volume of appropriations involves a corresponding increase in the volume of construction and installation work, since in housing construction the latter volume is close to 100%.

The calculation of the volume of construction and installation work for different ministries and departments should also be differentiated according to the different industries if possible, since the capital investments of an industrial ministry, for example, also include investments in housing and cultural construction, etc.

The material requirements for capital construction are determined on the bases of available material stocks of metal, lumber, cement, and wall-making materials. In the balance sheets of materials drawn up by the government central planning organs the material requirements for construction are determined by the volume of construction and installation work of every ministry and the quantities of materials to be used per one million rubles of construction and installation work. In these calculations priority is given to the most important construction projects scheduled to be commissioned, and provisions are made for supplying them with all the necessary construction materials and equipment in full conformity with the plan for financing them. By distributing the material funds allocated for construction purposes among the various projects, the ministries are able to solve the supply problem of all construction projects.

The problem of providing the construction projects with all the necessary material and technical supplies requires that the delivery of material and equipment be timed so as to speed up the introduction of basic capital and particularly the completion of the most important projects scheduled for commission.

The materials required for capital construction are listed as an independent item in the expenditure column of the balance sheet of available metal, lumber, cement, and wall-making materials.

Capital construction requires considerably more cement and wall-making materials than lumber, and much less rolled ferrous metal. It nevertheless accounts for more than 1/5 of the rolled metal.

The establishment of correct progressive norms for different industries is begun in the first stage of drafting the national economic plan inasmuch as the changes in the industrial structure of the construction and installation work serve to change the norms of material expenditure. These norms fluctuate sharply according to the particular industries. Thus, for example, the expenditure of cement per million rubles of construction and installation work in the construction of power plants is 3 times that in the construction of lumber and paper industry enterprises, and 1/3 higher than in the construction of machine-building enterprises. In the coal industry, the expenditure of lumber materials per one million rubles of construction and installation work is approximately twice as high as in the machine-building industry. With such fluctuations it is impossible to use the average norms for the national economy or for a particular ministry. Account should be taken of the changing industrial structure of construction work. A strict account should also be kept of the changing nature of construction and installation work at the different stages of construction of different projects. All this requires that the planning of capital works, for a particular ministry or on a national scale, be based on concrete data which, in turn, are based on the figures for individual construction projects.

Allocations of materials made on the basis of the average index, one million rubles of construction and installation work, involve serious shortcomings since they are not designed to take

into account the structural aspect of the work. One million rubles of construction and installation work is structurally different in different cases. In one case, for example, the major job is earth work, in another it may be finishing work, in still another, installation work. The improvement in the allocations of materials and labor for construction purposes calls for defining the work volume in natural rather than in monetary terms wherever possible.

The planning of material expenditure norms must take into account every possibility for economizing metal, lumber, and other materials.

The material expenditure norms are established, first of all, on the basis of the best indexes attained in the process of construction itself. Hence the necessity for a thorough study of the leading experience amassed in construction with a view to supporting the mentioned norms with a system of concrete measures designed to introduce and popularize advanced construction methods.

The planning of material expenditure norms must also take into account the additional economy made possible by the adoption of industrial methods of construction and the use of more effective materials.

The substitution of ferroconcrete structural components for steel ones can produce a very large economy. In the construction of one-story industrial buildings, the expenditure of structural steel can be cut by more than 1/2 by increasing use of ferroconcrete. In housing construction, the use of prefabricated ferroconcrete parts reduces the expenditure of lumber by 20-25%. The large-scale use of ferroconcrete structural components also means a further

industrialization of construction, a greater output of prefabricated buildings and installations, a higher productive efficiency of the projects under construction, and shorter construction periods.

To pursue the aim of construction industrialization, it is necessary to make allowances in the balance sheets of construction materials for the possible progressive changes in the quantities and types of such materials to be used in construction.

The use of prefabricated ferroconcrete parts, large panels, and large wall blocks not only reduces the material expenditures required by the particular construction project, but also shifts some of the expenditures from the construction site to the plants. The construction site then becomes a sort of an assembly department while the construction departments are transferred to the plants manufacturing the various structural components and parts.

The effect of the further industrialization of construction on the balance sheets of construction materials will be, first, an increasing relative share of factory-made structural components and parts; second, the expenditure column of the balance sheets of metal, cement, and lumber will show an increasing demand on the part of the plants producing structural components and parts and a correspondingly decreasing demand by the construction organizations.

The planning of material supplies for the construction program must exert a strong influence on the production and consumption of construction materials, make the necessary provisions for reducing the expenditure of construction materials and promote the large-scale introduction of the latest types of construction materials, structural components, and parts.

The production of construction materials in the USSR is developing at a rapid pace. Compared to 1940, the 1954 production of cement by the enterprises of the Ministry of the Construction Materials Industry USSR increased 3.4 times, the output of slate 6 times, brick 3 times, window glass 100%, etc. The construction materials industry, however, does not adequately meet the needs of construction. The industry is still slow in mastering the production of important construction components.

It was pointed out at the 1954 builders' conference that the output and introduction of structural components and parts were developing very unsatisfactorily. For example the 1954 demand for prefabricated structural components was 4 million cu m, while the production of such components amounted to less than 2 million cu m. With an annual demand for plaster board for partitions and covers amounting to 2.72 million cu m, the output of those materials planned for 1954 was only 433,000 cu m.

The buildings with ferroconcrete frames put up by the Ministry for the Construction of Enterprises of the Metallurgical and Chemical Industry in 1953 accounted for only 8.5% of the total building space added during the year, and in the case of the Ministry of Construction USSR, the figure was only 16.5% of the total building space put into operation.

The central problem connected with the production and improvement of construction materials, structural parts, and components is to sharply increase the production and use of prefabricated ferroconcrete.

One of the problems to be solved in the planning of capital works is, as was pointed out above, to speed up construction, reduce

its costs and improve its quality by industrializing the construction process. The basic element of this problem is the large-scale use of modern prefabricated structural components and parts in construction.

Ferroconcrete is the most universal and durable type of construction material. The use of ferroconcrete could save 60% of the steel and reduce the amount of labor required in construction to  $1/3$  or  $1/4$  as compared with the use of monolithic concrete. The use of ferroconcrete in the amounts fixed for 1955-1956 will reduce the demand for structural steel components alone by one million tons. Particularly effective from an economic point of view are prestressed structural components which reduce the expenditure of steel for construction purposes 2.5-3 times.

On 19 August 1954 the TsK KPSS and the Council of Ministers USSR adopted a decision "on developing the production of prefabricated structural components and parts for construction purposes."

An All-Union conference on the use of ferroconcrete and concrete was held in May-June 1955. The conference adopted important decisions and recommendations designed to further the progress of the construction industry.

The initial plan for the production of prefabricated ferroconcrete structural components and parts, provided for in the decision of the TsK KPSS and the Council of Ministers USSR of 19 August 1954, has undergone a sharp upward revision. It has been decided that the production of prefabricated ferroconcrete structural components and parts should be raised to 9 million cu m in 1956 and 13 million cu m in 1957 instead of the originally planned 9.8 million cu m.

Prefabricated ferroconcrete will play an important role in implementing the extensive program of capital construction required to promote agricultural production. The large-scale use of prefabricated ferroconcrete is needed particularly for construction in the virgin land areas. Ten plants and 3 all-purpose construction sites for the production of ferroconcrete structural components and parts are scheduled to be built in 1955 in the virgin land reclamation areas. The prefabricated ferroconcrete will be used to construct grain-storage places and warehouses. Such plants and production sites will be built in the Kurgan, West-Kazakhstan, Pavlodar, and North-Kazakhstan oblasts and in Altai Kray.

The industrialization of construction requires that the construction organizations discontinue producing their own construction materials and parts. But the wide gap between the industry's output of construction materials and the demand for them will have to be filled by the construction organizations. Thus until recently the Ministry for the Construction of Enterprises of the Metallurgical and Chemical Industry was compelled to produce up to 80% of the necessary wall-making materials, all of the wooden and ferroconcrete structural components and parts, and up to 50% of the lumber materials, and mine almost 100% of the nonmetallic construction materials in its own enterprises, logging camps, and quarries. The construction industry is experiencing a severe shortage of technical sanitation equipment, high-strength cement for ferroconcrete production, thin sheet metal, galvanized roofing metal, and steel cables.

The construction projects are waiting for the industrial enterprises to supply them with effective materials and manufactures.

The builders need large quantities of prefabricated ferroconcrete parts and structural components, strong and quick-hardening cement, large slag, silicate, ceramic and brick blocks, perforated brick, construction slate, insulation materials, etc. So far the output of these progressive manufactures has been inadequate. There is much talk about large silicate blocks, for example, but their mass production by industrial methods is still nonexistent.

The decision of the KP and government provides for a program designed to bring about a sharp increase in the output and improvement in the quality of construction materials in the next few years. To promote the further expansion of construction and the production of prefabricated structural components and parts, the 1957 output of cement will be increased 1.6 times, as compared to 1954, and the production of quick-hardening cement will be brought up to 2 million t. Provisions were made for stepping up the production of plaster board panels, hollow brick, stone and ceramic facing plates, fibrous wood plates, linoleum, and other materials and parts. The output of wall blocks -- made of concrete, slag concrete, natural stone, and brick -- in 1958 is scheduled to be 3.7 times as large as in 1954.

All this will advance the construction of buildings and installations a step nearer to the conveyor method of production.

The construction materials industry is still slow in introducing progressive production methods.

In many brick-making plants, the average monthly output per cubic meter of kiln is from 800 to 1,400 bricks. At the same time the leading plants using the Duvanov progressive kilning method

managed to raise their output 2,400-2,500 bricks. It has been estimated that the country's brick production could be doubled without any additional capital investments if all the plants used the Duval now kilning method.

The balance sheet of labor forces and specialists drawn up on a national economy scale take into account the required numerical increase of workers and specialists in the building trade. Of particular importance are the balance sheets of prospective labor resources and their utilization. These balance sheets are used as a basis for the current program of training specialists as well as qualified construction workers.

A high rate of construction expansion can be secured only when labor productivity in construction is increasing. The major prerequisite for the coordination between the available labor resources and the capital works plan, therefore, is the all round improvement of labor productivity in construction work. From the viewpoint of planning methodology, that means that labor productivity (output) is to be determined first, and the number of workers is to be determined on the basis of that output.

The indicator of the volume of construction and installation work per average worker, expressed in budgetary cost, is used as an indicator of labor productivity.

The planning of a higher labor output in construction must first of all take into account the highest indicators attained by the construction trusts, sections and brigades. And just like the planning of material expenditures for construction purposes, this calls for a thorough study of leading experience and for concrete planning measures designed to popularize such experience.

The nature of construction and installation work varies with different years. In view of this, the index of labor efficiency based on the volume of construction and installation work and used for calculating the labor resources required for the construction program should be the final, not initial, index. The initial index to be used for calculating labor productivity is the quantity of materials expended on individual construction projects.

The planning of increasing labor productivity must take into account the benefits to be derived from the further industrialization of construction. The increasing use of the prefabricated method of construction serves to save a great deal of working time.

Thus, for example, the substitution of large slabs for ordinary bricks makes the work of the construction workers easier. It takes approximately one million bricks to build a 5-story building. They have to be moved, raised, and laid into walls. Each brick must be handled at least 7 times before it is laid in place. Many bricks are crushed in transportation.

The use of large slabs in construction facilitates a sharp increase in labor productivity. It takes 2 bricklayers to put up a  $3.5 \text{ m}^3$  brick wall in 8 hours. Two workers using large slabs can put up  $25 \text{ m}^3$  wall at the same time. This means a 7-fold increase in labor productivity. The use of large slabs in construction also reduces the use of bricks which are still a basic wall-making material.

Labor productivity can be increased still further by the use of prefabricated ferroconcrete in the shape of plates, beams, columns, cover and wall panels, girders for cranes, foundation slabs, flights of stairs and landings, coal mine props, and other components.

The planning of additional qualified labor forces is based chiefly on the training of construction workers in the labor reserve system as well as in special schools attached to the construction combines.

Between 1940 and 1954 2,219,000 building trade workers were trained in factory-and-workshop schools and trade schools.

The increasing use of prefabricated ferroconcrete in production will also increase the demand for workers qualified in assembling ferroconcrete structures.

The liquidation of the turnover in labor is an important problem in the matter of securing the required labor force for construction projects. Many enterprises lose about 1/2 of their labor force during the year.

The present fluctuation of labor is not primarily due to seasonal production. The construction sites are now well equipped with construction mechanisms, the work has been mechanized to a higher degree and the output of prefabricated ferroconcrete structural components and parts has been growing from year to year. All that made it possible to eliminate the seasonal feature of construction and its dependence on the time of the year. The seasonal aspect of production as a mass phenomenon has been eliminated.

One of the reasons for the labor turnover in construction is that in many cases more than 1/2 the construction workers are still poorly qualified. And it is this unqualified contingent of workers that accounts for the labor turnover.

In addition to the statewide measures to train qualified workers, it is necessary to create favorable conditions at the

construction projects for auxiliary workers to learn trades, for beginners to improve their qualifications, and for qualified workers to learn 2 or 3 trades. Another prerequisite for the struggle against labor fluctuation is the constant care of the daily needs and cultural amenities of the construction workers.

It was reported in the press that the labor force of the Kiev construction and installation trust has been changing every year due to the lack of housing. In 1954 the trust built less than 22% of the housing for its own workers. But in the past 3 years the trust lost about 300,000 rubles by paying the travel expenses of the contractual workers from the villages to the city. This is equivalent to the cost of a communal house for 100 people.

The effort to create permanent qualified cadres is an integral part of the struggle for the industrialization of construction.

The KP and the government have outlined important measures designed to provide housing for the construction workers and to improve their training system and daily and cultural services. The basic cadres of the continuously operating contract construction organizations must be provided with adequate living space in well built houses during 1955-1957. The construction ministries and the Main Moscow Construction Trust under the Moscow city executive committee are duty bound to build and commission 5.3 million sq m of living space, kindergartens for 22,000 children, and nurseries for 14,000 children in 1956-1957; 103 clubs must be built within 3 years. The construction workers will also get 10% of the living space in the buildings built for other clients.

Provisions have been made to improve the organization of public catering at the construction sites as well as at the enterprises of the construction materials industry.

Under the vicious wage-paying practice that came into use in the construction industry, the workers are paid according to the administration to which the particular construction is subordinated; workers doing the same kind of work in projects located next to each other receive different wages. The shortcomings in calculating the wage and labor scales of the construction workers are conducive to a large labor turnover and lower labor productivity.

On 23 August 1955, the Central Committee of the CP USSR and the Council of Ministers USSR approved several measures designed to eliminate these shortcomings. According to one of these measures, effective on 1 January 1956, all the ministries and departments are instructed to use uniform output norms and valuations of construction and installation work, uniform rates-and-qualifications manuals, and new uniform zonal differences in rates and prices.

A uniform 7-grade wage scale will be introduced on 1 January 1956 for all workers employed in construction. Also to be introduced is a uniform scale of progressive piece work pay. If the output quota is overfulfilled up to 20%, the piece work rates are increased by 50%, and if the overfulfillment is more than 20%, the piece work rates are doubled.

The CP's decisions and those of the government designed to improve the organization of labor and wages as well as the housing conditions and cultural needs of the construction workers will help greatly to train permanent qualified cadres of construction workers.

One of the major purposes of the financial plan of the national economy as a whole is the financing of the capital works plan.

The proportions of material expenditures and the proportions of labor distribution among the various industries can have real meaning only when supplemented by a coordination between the revenue and expenditures of the state (state budget), various state and cooperative organizations (balance sheet of income and expenditures), and the population (a balance sheet of the people's financial income and expenditures). Indicated in the national economy plan, in addition to the budgetary cost, is the actual cost of construction during the given plan year and the task of cutting construction costs still more in comparison with the budgetary costs. The directives of the Nineteenth CP Congress on the Fifth Five-Year Plan provided for a general increase in the volume of state capital investments in 1951-1955 of about 90% and a 60% increase in government appropriations for construction purposes, as compared with the Fourth Five-Year Plan; the remaining 30% were made up by reducing construction costs through higher labor productivity, reducing overhead expenditures and prices on construction materials and equipment.

The combined financial plan includes the income and expenditures of all state and cooperative organizations and reflects the financial relationship between the state and the population. The entire volume of the capital investments made by state and cooperative organizations is reflected in the financial plan.

The volume of construction and installation work, performed on a contract basis, is reflected in the expense column of the plan under budgetary costs since the client pays for work according to

budgetary costs. The profits of the construction organizations provided for in the budget as well as the surpluses accumulated by reducing the cost of construction and installation work, as compared with the budgetary costs, are reflected in the revenue column of the financial plan.

The volume of construction and installation work performed in a routine manner is indicated in the expenditure column of the plan minus the economy (to be achieved by reducing production costs), that is, in terms of planned production costs.

The cost of purchased equipment is reflected in the expenditure column in prevailing prices. The financial plan also reflects the equipment actually acquired during the year, while the capital investments plan does not include the equipment acquired, but not yet installed, during the plan year. On the other hand, the capital investments plan does include the previously acquired equipment which is installed during the plan year.

All these peculiar methods of including various parts of the capital investments plan into the financial plan must be taken into account when auditing the financing of the capital investments plan.

The financial plan reflects in summary form the entire economy achieved by better planning and improved construction on the basis of an advanced technology. It is used as a strong economic weapon for promoting the reproduction of basic capital in every way.

The coordination between the capital works plan and the financial plan is necessary also for planning the division of the

national income into consumption, accumulation, and reserve funds through the medium of the financial plan.

The substantiation of the capital works plan, as we have seen, is based initially on the coordination between the capital works plan and the national income. Further, the capital works plan comprises a system of balances which are expressed as proportional capital construction in the national economy. Finally, the financial plan again calls for the coordination between the already elaborated and detailed capital works plan and the balance-sheet of national income.

#### CHAPTER V. PLANNING THE CONSTRUCTION INDUSTRY

The construction industry is an independent specialized branch of the national economy. The USSR's construction industry now combines several thousand contracting organizations which account for more than 80% of all the construction work. The contracting organizations' relative share of the total volume of construction and installation work continues to grow.

Capital construction is carried out by 2 methods, the contractual method and the client method (the word client is used here for lack of a better equivalent of the Russian term "khozaiistvennyi" or "economic" which is not descriptive of the mentioned method -- Trans.).

The contractual method of construction is the more effective one. According to this method, the construction work is carried out by a self-supporting contracting construction organization specializing in construction work; it has its own material-technical base, mechanisms, transportation facilities, working capital, housing,

and permanent construction cadres. As a rule, the contracting organization has all the facilities for industrialized construction, that is for making large-scale use of finished construction parts, semimanufactures, and factory-made structural components.

The client method of construction is carried out by the organization for which the construction project is meant. In such cases the possibilities for specialization are quite limited, the cadres are not permanent, etc. Since construction is not the main function of the particular organization, it has no strong incentive for improving the method of construction work.

The sphere of activities of the contracting construction organizations in the USSR is being systematically expanded. In several of their decisions, the KP and government emphasized the need for strengthening the contracting construction organizations. This does not mean that the client method of construction may be discontinued altogether since it is impossible to discontinue relatively small construction jobs. The contractual method, however, must account for an ever increasing share of construction.

At present the contracting construction organizations are combined into the following separate specialized ministries: the Ministry of Construction of the USSR; the Ministry for the Construction of Enterprises of the Metallurgical and Chemical Industry, the Ministry for the Construction of Oil Industry Enterprises, the Ministry for the Construction of Electric Power Plants, the Ministry of Transport Construction, and the Ministry for the Urban and Rural Construction of the USSR. The housing and civilian construction in Moscow is carried out by a huge territorial construction administration, Glavmocstroy. Contracting construction organizations are available also in the nonconstruction ministries.

The construction and installation work performed by the ministries and departments by the so-called client method, that is without the aid of contracting organizations, is listed in the capital works plan under the name of the particular organization. The work performed by special contracting organizations is indicated in the capital works plan under both the client ministry and the contractor ministry.

The part of a ministry's capital works plan to be performed by contracting organizations is turned over to the contracting ministries along with the specifications for construction and installation work, labor output, utilization of machinery and materials, and the cost of construction and installation work; the volume of construction and installation work is distributed among the mentioned ministries.

Acting on the basis of the approved plan for the development of the national economy, the clients and contractors conclude the following agreements with each other: a general agreement covering the entire volume of work provided for by the general construction budget and direct agreements covering definite parts of the budget.

Agreements are also concluded between the general contractor and various specialized organizations on subcontract work such as technical-sanitation, hydrotechnical and electrical installation jobs, etc.

Work assignments to various construction trusts are made by ministries and main administrations on the basis of the approved state plan and agreements. The construction trusts, in turn, approve the annual, quarterly, and monthly plans for the construction administrations.

The construction organizations not only get their quantitative and qualitative assignments in connection with construction and installation work. The plan also specifies their rights to acquire the material and financial resources necessary for implementing their plan. The construction organizations are given working funds, payroll funds, a plan to secure the required qualified labor force for construction work, etc. The contracting construction organization operates on a self-supporting basis. Its accounts with the client are settled upon the latter's acceptance of the construction items, which are estimated individually, or larger structural components.

By its economic structure the construction industry is actually part of heavy industry but in every aspect of the plan it is singled out as a separate independent industry.

Its one feature in common with the rest of the industry is that the construction industry produces a material product without the aid of the natural reproduction process while in all branches of agriculture the economic process is interwoven with the natural process of reproduction. However, in view of the peculiar characteristics of the construction industry, its development is planned separately and its indexes are not included in the indexes of the industry as a whole. Thus, for example, the gross output of the industry does not include the output of the construction industry. The same is true of the indicators of labor productivity, reduced costs, etc.

The construction industry is listed in the plan as a special industry in view of the peculiar nature of its material output.

The construction industry "puts out" basic capital. The material aspect of the construction industry's output is embodied in the commissioned plants, mines, machine-tractor stations, railways and other roads, buildings designed for social-cultural institutions, etc; also, in construction begun by the end of a given period and representing unfinished plants, mines, roads, schools, etc.

Strictly speaking, the gross output of the construction industry should also have included the cost of all the above-listed projects, both finished and unfinished. Actually, however, the planning connected with the construction industry contains one substantial exception in the general rule of calculating the gross output. The cost of the equipment subject to installation is not input. The cost of the equipment subject to installation is not included in the gross output of the construction industry. These are the reasons for it:

First, although it accounts for a large relative share of the cost of the construction projects, the equipment does not require any additional processing;

Second, the inclusion of the cost of equipment in the total cost of the construction output would make it difficult to compare the portion of the output volume of various organizations or of different periods which represent the work of the construction workers themselves. Indeed, with the same work load of the construction organization, its gross output could be larger or smaller depending on the cost of the equipment to be installed. Other expenditures, besides the cost of equipment, unrelated to the work of the construction workers but included in the capital investments should not be, and are not, included in the output of the construction industry. Among them are the expenditures involved in the

training of cadres for a future enterprise, the improvement of land for construction purposes and several others listed under the general title "other expenditures."

As for the unfinished capital works, the principle of computing the gross output is the same as in industry: only the increment of unfinished capital works is included in the gross output.

Following is an example of determining the total volume of the construction industry's output.

The unfinished construction on the first of the year amounts to 80 billion rubles; 130 billion rubles' worth of basic capital is to be introduced during the year; unfinished construction by the end of the year should amount to 90 billion rubles; the cost of the equipment within the limits of the capital investments of the given year is 45 billion rubles; and other expenditures amount to 8 billion rubles.

In this case the gross output would be: 130 billion rubles, representing the construction "commodity output," plus 10 billion rubles of unfinished production increment (90-80), minus 45 billion rubles' worth of equipment and 8 billion rubles of "other expenditures."

$$130 + (90 - 80) - (45 + 8) = 87 \text{ billion rubles.}$$

What is the volume of capital works during the given year?

It obviously amounts to

$$130 + 90 - 80 = 140 \text{ billion rubles.}$$

If the cost of equipment and the other expenditures are excluded from that volume, we will get the cost of construction and

installation work:

$$140 - 45 - 8 = 87 \text{ billion rubles.}$$

Thus the output of the construction industry, calculated by the same method as the gross output of the other industries, coincides with the volume of construction and installation work.

The planned output of the construction organizations actually exceeds the volume of construction and installation work since the special construction organizations also do part of the capital repair work as well as certain types of work connected with the major operations of industrial and other enterprises.

Thus the output of the construction industry, as expressed in monetary terms, represents the volume of construction and installation work which is determined in the same manner as the output of the other industries.

In what way, then, is the output of the construction industry so different as to be in a class by itself, apart from the rest of the industry? The difference is entirely due to the fact that the construction industry produces fixed capital, not circulating capital. Even the machine-building industry does not produce ready-to-work basic capital. The machines cannot be put to practical use before the appropriate buildings and installations are ready for them. This applies even to transportation facilities, the equipment of the extracting industry, tractors and other types of equipment which, though not subject to assembly or installation, cannot be exploited without depots, repair shops, garages, roads, etc.

Thus even the finished machines require additional social labor before they can be turned into operating basic capital.

By putting up buildings and installations and installing equipment, the construction industry creates the preconditions for converting the machines into productive basic capital.

In addition to this basic difference of the construction industry, mention should be made also of its different characteristics in the field of production technology, namely:

The output of the construction industry is utilized on the spot; following the completion of a project, therefore, the construction process is shifted to another place while in all other industries it remains fixed to the same place; the construction site is selected primarily by the operational advantages of the future project and not by considerations of cost or convenience to the construction organization;

construction goes through a very long production cycle often extending to a number of years;

in the great majority of cases construction is individual: in every job account must be taken of the peculiarities of the construction site, of the particular equipment to be installed in the project, etc.

It should be borne in mind, however, that in the future, when construction is carried out entirely by the use of prefabricated structural components and parts for standard projects, the second and third features of construction will lose their significance.

The planning of the construction industry, in all its aspects, is subordinated to the problem of implementing the construction and installation plan at the lowest possible cost in working time, material and financial resources.

The capital works plan is one of the most important parts of the entire state plan; its implementation calls for enormous expenditures of labor, material, and financial resources.

To make the necessary provisions for the capital works plan it is not enough to determine the volume of construction and installation work to be performed for each ministry; it is also necessary to determine the volume of construction and installation work each ministry should complete and the particular labor, material and financial resources it needs for doing it.

The planning of the development of the construction industry as a whole consists in, first, the planning of construction work to be assigned to the construction organizations, that is the industry's own planning; second, the planning of government measures designed to ensure the further development and strengthening of the construction industry and, primarily, its performance for such non-construction organizations as the heavy industry, transportation, and the labor reserve system.

In socialist reproduction, the implementation of all these tasks is closely interrelated. It is nevertheless methodologically important to single out what is connected with the mobilization of the reserves of a given industry, that is the construction industry; the plan-specified assignments of the other industries must, in this connection, be considered as already defined and used as pertinent information in planning the construction industry.

The planning of the construction industry covers every aspect of activity of the construction organizations. It is designed to speed up the introduction of basic capital, assure a high quality of the commissioned projects, and the most economical expenditure of materials for construction purposes.

The CP and the Soviet Government have always devoted much attention to the development of the construction industry. The decision of the Council of People's Commissars and the Central Committee of the All-Union KP (bolsheviks) of 11 February 1936, "On improving construction and making it cheaper"; the decision of the Council of Ministers USSR of 9 May 1950, "On reducing the cost of construction"; the decision of the Central Committee of the CP USSR and the Council of Ministers USSR of 19 August 1954, "On the development of the production of ferroconcrete structural components and parts for construction purposes"; the decision of the TsK KPSS and the Council of Ministers USSR adopted on 23 August 1955, "On measures designed to promote the industrialization, higher quality, and lower cost of production"; and several other party and government decisions are examples of concrete leadership in improving construction on the basis of higher technology.

In December 1954 the TsK KPSS and the Council of Ministers USSR called an All-Union conference of builders, architects, workers of the construction materials industry, construction and road-building machinery and of projects and scientific-research organizations. That conference produced the most valuable material for the further improvement of the construction industry.

The All-Union Conference of Builders in 1954 adopted the text of the following appeal to all construction industry workers:

"Our chief problem is to shorten the construction periods, introduce new buildings and installations on time, reduce the cost of construction and improve its quality."

The modern construction technique and the enormous experience in capital construction amassed in the USSR make the successful solution of that problem possible.

The shortening of the construction periods is closely connected with the reduction of construction cost.

Thus, for example, calculations show that the reduction of the period of mine construction from 8 to 4 years makes it possible to reduce the actual cost by about 10%. Considering the present scale of mine construction, the total annual economy would amount to about one billion rubles.

The reduction of construction time is important also from the point of view of the entire national economy. The less time it takes to build an enterprise, the sooner it gets into operation producing commodities for the national economy and speeding up the process of socialist reproduction as a whole. The possibilities for reducing construction periods, however, have not yet been fully explored.

In the coal industry, for example, hundreds of new pits and open-cut mines are under construction at the same time. The capacity of the mines commissioned annually is almost 1.5 times as great as that of the entire coal industry in Tsarist Russia. Construction, however, is slow. In the Moscow coal basin the mines are kept under construction 4 to 6 years, and in the Donets basin and other areas 7-8 years, that is 2-3 times longer than is possible with modern

technology. The systematic lag in mine construction acts as a brake on the development of the coal industry and the entire national economy. The reason for that lies not only in the unsatisfactory planning of capital investments, the scattering of facilities, etc, but also in the organization of construction work.

The experience of leading construction has served to reveal enormous possibilities for reducing construction periods.

Thus the shaft-sinking brigades of the Stalin-shakhtoprokhodka trust, headed by Ivan Pilipenko and Peter Gulyashov, not only manage to reduce the planned shaft-sinking time but seek to reduce that time still further. These brigades began the sinking of the Kalinin mine shaft in January 1955. Its full depth is 457 m. According to the plan, the sinking of such a shaft takes one year. The leading mine workers introduced basic improvements in the organization of shaft-sinking. They improved the water-pumping process, mechanized the process of earth-loading from the bucket hoists onto dump trucks with the use of pneumatic shut-off devices, improved the lighting and signal system in the shaft and, what is most important, combined several operations to be performed simultaneously. The water-pumping operation was particularly successful. A water-retaining ring was installed underneath the water-bearing soil of the mine; from that ring the water was moved to the surface by special water hoists or air lifts. This simple automatic equipment worked without a break. There is so little water leaking into the stope that it can be removed with buckets together with the slime. As a result, the annual shaft-sinking plan at the Kalinin mine was completed in 4 months!

The brigades headed by comrades Pilipenko and Gulyashov have already topped the highest shaft-sinking indexes in the world. The highest speed of shaft-sinking was attained by the British in 1954 in the Merris-Spruit mine in South Africa. The shaft of that mine, 308 m deep, was sunk at a speed of 182 linear m per month. The shaft workers of Pilipenko's brigade and the timberers of Gulyashov's brigade produced over 200 linear m of finished shaft in March!

Experience has shown the great possibilities for reducing construction periods in all branches of the national economy.

It is possible to build a machine-building plant within a short period. The Yuzhpromstroy trust, for example, built a large industrial enterprise in 150 days.

It was proved that a furnace can be built in 7-8 or even 5-6 months. On 12 April 1955 the second furnace was blown in at the Stalin metallurgical plant in Rustavi. The furnace had been built in 9 months. Observing the technological rules of construction, which were based on a combined chart, made it possible to complete the furnace so soon. The Dneprodzerzhinsk workers built a furnace in 8 months. What accounts for their success? First of all, the observance of the high-speed construction principle: thorough and well thought out preparations, prefabricated structural components, a high mechanization level, the combination of labor processes, and the concentration of effort and facilities on the major targets.

The experience of the leading workers shows that there are no objective reasons for mines to remain under construction 2-3 times as long as specified in the plan, and for cement plant construction to last 6-7 years, as is often the case, at a time when

under better management such plants could go into production 1 1/2-2 years after their construction began.

The enormous possibilities for increasing construction speed are revealed by the figures on the work done by Glavmosstroy in 1954; that work was achieved by the large-scale application of industrial construction methods.

It takes 8-10 months to build an 8-story apartment house in Moscow. Thirteen 5-story hotels were built in 8 months. A 5-story school building made of large blocks is built in 4 months, etc. The use of finished manufactures in trimming and finishing work plays an important part in the development of industrial construction methods. The use of dry trimming methods is constantly increasing. These methods accounted for 85% of the total volume of trimming work in 1953. The use of these methods reduces labor consumption to 1/3 or 1/4, shortens the time required to build houses and cultural buildings, and facilitates the solution of the problem of year long construction work. The mechanization of painting operations, it is true, has not reached the planned level, but painting was 61% mechanized as far back as 1954. The average labor used in construction work in 1954, 1.4 man-days per one cu m of building, has been reduced by 28% in the past 3 years.

The planning of the construction industry is called upon to contribute to the widest possible popularization of advanced construction methods.

The major objectives pursued by the planning of the construction industry are: the volume of construction and installation work performed by the different ministries; technical progress in the

industrialization of construction; improved utilization of construction machines and materials; higher labor productivity in construction; and lower cost of construction and installation work.

1. The Volume of Construction-Installation Work per Ministries

The volume of construction-installation work per ministries is the basic and decisive part of the plan for the development of the construction industry.

In the state plan, the volume of construction-installation work is distributed among the contracting organizations and the clients. Thus every contracting organization gets its assignment for both the total volume of construction and installation work and the amount of work to be performed for each client separately. Agreements between the contractors and the clients are concluded on the basis of that plan. These agreements control the mutual relations between the contractors and the clients during the implementation of the state plan.

It should be pointed out that the client ministry is responsible to the government for fulfilling the capital works plan approved for that particular ministry. This forces the client to keep an eye on the contractor's performance on the agreement and take the necessary measures to improve the work of the construction organizations and, if necessary, to apply financial sanctions.

In the national economy plan the responsibility for implementing the construction and installation work is fixed at the ministry and department levels. However the correct distribution of the total volume of construction and installation work must take into account the capacities of the various construction organizations

included in those ministries, the possibilities for improving their equipment, increasing their labor output, etc.

The volume of work to be performed by the construction ministries is also distributed according to the above-limit construction projects. If the title list shows what particular organizations have been assigned to build the various projects for a particular title list-holding ministry, then the list of projects to be erected by the construction ministry shows the distribution of the total work volume, to be carried out by the organizations of the construction ministry, between the clients and the construction projects.

## 2. Technical Progress and the Industrialization of the Construction

The expansion and improvement of construction work on the basis of advanced technology are designed to encourage the construction industry's active participation in the effort to achieve the maximum satisfaction of society's needs.

The introduction of new machinery and construction technology is contingent upon the successful development of heavy industry as a whole, particularly on its branches directly responsible for providing the material supplies for the construction industry: the ferrous metallurgical industry, construction and road machine-building, the production of structural components and parts, and the production of wooden and mineral construction materials.

The national economic plan provides for the all-round development of the industries contributing to the improvement of construction by industrializing it.

"The decisive precondition for the basic improvement in construction work is the further industrialization of construction,"

N. S. Khrushchev told the All-Union Builders' Conference in December 1954.

The construction industry needs increasing quantities of the latest types of construction machines and mechanisms to cope with the ever growing volume of construction and installation work.

In the first 4 years of the Fifth Five-Year Plan the basic capital of the construction organizations was increased 1.5 times, excavators 2.6 times, heavy-duty scrapers 4.4 times, bulldozers 3.4 times, and caterpillar, tower, truck and rail cranes 4 times.

However a further improvement is now required in the production of construction machinery designed to solve the current problems of labor mechanization and the large-scale introduction of prefabricated construction methods.

It should be emphasized that the various construction mechanisms are functionally closely related to each other. The efficient utilization of a powerful excavator, for example, largely depends on the mechanization of other types of earth-moving work: earth removal, loading and unloading, ground leveling, etc.

The mechanization of the basic work processes is no longer a problem -- that problem was in the main solved by the end of the Fourth Five-Year Plan. The present problem is the complex mechanization of the construction processes.

Certain successes have already been achieved in developing complex mechanization. In 1953, 79% of the earth work and 68% of the concrete work were performed by the complex mechanization method. The construction machine-building industry, however, has so far

failed to provide the construction projects with the machines and mechanisms required for the large-scale complex mechanization of all construction processes.

In transportation construction, for example, manual labor still accounts for 10% of the road-bed work, 35% of the track-laying work, and 50% of the road graveling. Particularly much manual labor is still used for loading and unloading operations, trimming, roofing, and certain other jobs.

The mechanization of painting operations in construction is still at a low level both in the USSR and the rest of the world. But there are possibilities for mechanizing such work. Thus, for example, in the mechanization of plastering operations we are considerably ahead of the major capitalist countries.

In several cases the efficiency of the introduction of the latest machinery is kept down by the inadequate output of less complicated but badly needed machines for complex mechanization.

Only 36% of the earth work had been mechanized by the beginning of the Fourth Five-Year Plan. More than 850,000 workers had been employed in manual earth-work operations. In 1953 the mechanization level was raised to 90%. That made it possible to reduce the number of workers engaged in earth work by 500,000 and double the work volume at the same time. That problem was solved by organizing the large-scale production of highly efficient excavators, scrapers, bulldozers, graders, automatic graders, etc.

The mechanization of small earth-work operations is required to further develop construction industrialization. But the present output of small excavators with  $0.25 \text{ m}^3$  scoops is still inadequate. The production of excavators with  $0.15 \text{ m}^3$  scoops must also be organized.

A very important problem is the mechanization of loading and unloading, transportation and auxiliary operations. Of those operations 43% were mechanized in 1953. Increasing that volume 2-3 times would mean the release of 700,000 workers for other jobs. The output of new equipment is now being organized with that in mind.

It was pointed out at the 1954 builders' conference that we still do not have the simplest types of tamping machines for tamping the ground under crowded conditions. Nor do we have any of the urgently needed machines for processing and loosening frozen soil and for unloading cement and other free-flowing materials under construction conditions. There is a shortage of mechanisms for finishing operations. Quite inadequate also is the output of various devices for highly efficient machines which would widen the scope of operations and improve the utilization of those machines. There is little production of clamping devices for cranes designed to lift various types of freight, and special scoops for excavators.

The decision adopted by the TSK KPSS and the Council of Ministers USSR on 23 August 1955, outlined a program of increasing the existing pool of construction machines and mechanisms and of a more rational utilization of the available machinery. The problem facing the builders in this connection is to raise the average complex mechanization level for the construction industry in 1957 to 90% of the earth work, 85% of the stone-crushing work, up to 95% of the assembling of ferroconcrete and steel structural components, and up to 70% of the loading and unloading operations.

The current problem, in addition to complex mechanization, is to replace obsolete construction machines by new ones. This

calls for the designing and production of new machines adaptable to the latest construction methods. Particularly important is the introduction of new machines that would enable us to use new and better construction materials and factory-made structural components and parts.

In addition to heavy modern construction machines, the plans should also provide for the large-scale introduction of so-called minor mechanization (containers, simple devices, improved tools, etc.). The machine-building industry still refrains from supplying the construction industry with minor mechanization facilities.

One reason for the slow introduction of new construction machinery is the unsatisfactory work by scientific-research organizations.

The TsK KPSS and the Council of Ministers USSR outlined concrete problems for the scientific-research organizations and charted the course of their future work.

An academy of construction and architecture USSR has been opened under the State Committee of the Council of Ministers USSR for Construction to elaborate the important scientific problems in construction and architecture and coordinate the scientific work done by scientific organizations and higher institutions of learning.

The construction organizations' requirements of more machinery are determined on the basis of every different type of machine by the following basic considerations: the volume of construction and installation work (in physical terms) performed by the particular type of machine; the output of one machine per work shift; the number of machine-shifts required for the total volume of work; the

number of machine-work shifts per year; the average annual number of machines.

The establishment of well-founded progressive annual output rates per machine is the central problem to be solved in connection with a particular type of construction equipment.

This also raises the problem of selecting the desired machine for a particular type of work. Earth-moving operations are performed by various types of excavators, hydraulic excavators, bulldozers, scrapers, and graders. Transportation work is carried out by trucks of various capacity, dump trucks, different types of cranes, etc.

The problem is to take full account of the requisites for technical progress. That problem amounts to:

1. Ensuring the complex mechanization of construction work and the replacement of manual labor by machines in all construction sectors.
2. Increasing the relative number of the most efficient machines in the total machine pool designed for every type of construction work.
3. The introduction of new and most advanced machines. Achieving a sharp improvement in the prefabricated production methods by the use of prefabricated ferroconcrete, large construction blocks, panels, and various types of factory-made structural components and parts.

The needs for construction and road-building machines and the requisites for technical progress in construction are first

determined by the construction organizations in their requisitions for equipment. Just like in the case of all departmental requisitions for equipment, the central planning organs check to see, first, if the norms of exploitation of the existing machinery, on which the requisition is based, are not too low and, second, whether allowances are made in the requisitions for possible technical progress.

Drafted in conformity with the program of providing machinery for construction purposes, the plan for developing the construction industry specifies the measures required for increasing the relative share of mechanized construction, including complex mechanization, affecting various types of jobs and work processes.

Technical progress consists, further, in speeding up the conversion to prefabricated construction methods which reflect a high degree of construction industrialization.

The preceding chapter dealt with the problems of supplying the construction industry with the structural components and parts required for introducing prefabricated construction methods. But the point under consideration is not only industry. Much depends on the construction organizations themselves; they have not yet used all available possibilities for introducing prefabricated construction methods.

The major prerequisite for industrializing construction is the expansion of the output of prefabricated ferroconcrete and its use in construction.

The tasks outlined in the plan for the development of the construction industry must be based on the rapid conversion to

progressive prefabricated construction methods. While the solution of the problem connected with the further mechanization of construction depends largely on the machine-building enterprises, the improvement of construction by the use of prefabricated structural components and parts, as was proved by the experience of the leading workers, depends primarily on the construction organizations themselves.

The decision of the TsK KPSS and the Council of Ministers USSR "On the Development of the Production of Prefabricated Ferroconcrete Structural Components and Parts for Construction Purposes" emphasizes that "the very unsatisfactory use of prefabricated ferroconcrete structural components in industrial, housing and agricultural construction, as well as the wrong use of metal and lumber, are not caused by technical backwardness but by the inertness and sluggishness of the planning organizations."

The use of the manifold (poligonniy) method of producing standard ferroconcrete structural components, which can be done on the construction site, has been particularly inadequate.

Still more intolerable is the inadequate use of large brick blocks. The situation in regard to the introduction of large brick blocks is particularly an unhappy one. Our Czech friends have already built enterprises for the production of large brick blocks which are successfully used in the construction of multistoried buildings. And here, in the birthplace of that method, such construction has not been widely popularized.

The large-scale use of containers is very important for achieving an economy in the use of bricks. But a new step forward

must now be made; that is to initiate the mass production of brick blocks by the brick plants. That will enable us to economize not only in the use of bricks but also in the expenditure of labor.

In line with the further technical progress in construction, one of the most important problems connected with the plan for the development of the construction industry is devising well-founded measures to improve the utilization of available machines and materials in the construction organizations. There are vast possibilities in that field. These possibilities should be taken into account when determining the progressive utilization norms for various types of equipment and materials.

The problem of complex mechanization is connected not only with the future replacement of manual labor by machines but also with the necessity of improving the exploitation of the powerful machinery already available in construction.

Mechanisms and construction materials are still kept idle for long periods in the construction industry. In the first 1/2 of 1954 the single-scoop excavators were idle 23% of their working time, the scrapers 30%, and the tower cranes 24%.

The planning of production quotas on the basis of the output per machine should be adjusted not to the average annual indicators, which are frequently too low due to idle machinery, but to the actual output per work shift achieved through the most efficient exploitation of machines and mechanisms. The reduction in the expenditure of metal, lumber, and other materials in construction should also be guided by the experience achieved in the leading construction projects.

### 3. The Improvement of Labor Efficiency in Construction

The improvement of labor efficiency in construction is very important for the national economy. A large army of workers is engaged in construction. The rate of basic capital reproduction at lower costs depends on the growing labor output in construction.

The output of labor in construction has been increased 3.5 times in the past 25 years. But the problems facing us now call for such an expansion of basic capital as is possible only under conditions of still higher labor efficiency in construction.

The Nineteenth Congress made it obligatory to increase the output of labor in construction in 1955 by 55% as compared to 1950. But in 1954 the labor output was only 32½ above the 1950 level. Although the supply of machinery and effective construction materials and the improvement in planning depend primarily on industry, transportation, and the planning organizations, the improvement of labor efficiency and reduction in construction costs are determined largely by the construction organizations themselves. The plan contains specific requirements for higher labor efficiency to be met by each construction organization every year (in the national economic plan such requirements apply to ministries). These assignments take into account not only the general measures specified in the plan but also the reserves available in construction. The principal objective of these assignments are the progressive methods of construction work.

The rate of increasing labor output in construction, just as in the other branches of the national economy, must be faster than the average rate of growing wages. However in the first 4 years of the Fifth Five-Year Plan the real wages of workers and employees

went up 37%, thereby exceeding the level envisaged for the entire five-year plan, while the labor output in industry was up 33% and in construction 32%.

The increase in workers' wages must be based on better organization of labor, the introduction of progressive construction methods and on the higher qualifications of the workers.

The construction organizations are still slow in introducing the well-tested methods of raising labor productivity. Thus, for example, the package method of delivering bricks is preferable even to the use of containers since the latter require tens of thousands of tons of metal for their production. The package delivery method makes it possible to eliminate manual work in loading and unloading operations. The transportation of wall-making materials in packages placed on small bottom plates is particularly important for construction in the villages. One bottom plate costs 25 rubles but a container costs over 200 rubles. The labor involved in such deliveries is reduced 20% and the total delivery cost by 17-20%.

So far, however, little attention has been paid to the introduction of the package method of delivering bricks which would make it possible to dispense with the labor of many thousands of workers engaged in the loading and unloading of brick, slag blocks, etc.

The liquidation of the labor turnover also largely depends on the construction organizations. The party and government devote much attention to improving the housing and daily living conditions of the construction workers. In the first 4 years of the Fifth Five-Year Plan the permanent living quarters for the construction workers were doubled. The cultural services for the construction workers

are being improved. The measures adopted in this field, in accordance with the decision of 23 August 1955, provide striking evidence of the party's and government's concern for the improving the housing and living conditions of the construction workers.

The construction organizations themselves, however, do not make satisfactory use of the available possibilities for improving the life of the construction workers.

The planning of higher labor productivity cannot be adjusted to the low labor output at the construction sites where not much attention is paid to the workers' living conditions, their qualifications and the training of so-called unskilled laborers, etc. The plan indicators of the output per construction worker are based on the progressive rates of working time utilization in the construction organizations which offer the best cultural and daily services for the workers in addition to the other measures designed to raise labor productivity.

#### 4. The Reduction in the Cost of Construction and Installation Work

Construction and installation work is approved in terms of budgetary expenditures. The client also pays for such work according to budgetary costs. The budget includes a certain amount of profit fixed according to the existing regulations.

The reduction in the cost of construction and installation work, as compared with the budgetary cost, increases the profit of the construction organizations just as the reduced cost of the industrial output increases the profit of the industrial enterprises.

The planning of a reduction in the cost of construction and installation work, however, has one important characteristic. In

the annual plan, the percentage of the reduction in the cost of construction and installation work is fixed not according to the cost level of last year, but on the basis of the cost specified in the budget. This is because of the changing nature of the work performed by the same construction organization in different years.

It is impossible to directly compare different types of construction and installation work just as it is impossible to fix the percentage of cost reduction for different types of industrial commodities. From the budgetary point of view, however, it is quite possible to compare the cost reduction during the plan year with that of last year since the economic content of the norms and prices specified in the budget is similar in every part of the budget.

For example, if the cost of construction and installation work last year was 7% less than the budget figure, and next year's plan calls for a 10% reduction in cost, as compared with the budget, it is possible to get a clear picture of the changing cost during the year.

The directives of the Nineteenth Congress of the KPSS on the Fifth Five-Year Plan call for a reduction in the cost of construction and installation work of at least 20% during the 5 years. The shortcomings in the utilization of material and labor resources in construction as well as the shortcomings in planning and budget fixing resulted in the failure to reduce the cost of construction and installation operations as provided in the plan.

The reductions in the cost of construction work computed for every construction organization are combined into plan assignments which are approved for the different ministries.

It takes a detailed analysis of the possibilities for reducing every component element of cost before the percentage of the reduction in the cost of construction and installation work can be determined. These are the component elements:

1. The materials at prices including free delivery to construction site. The reduction in the cost of this item is determined on the basis of the planned reduction of material expenditure on different construction elements and on the entire volume of construction and installation work to be carried out by the ministry.
2. The base wages of the workers. These wages are calculated so as to facilitate the plan-specified faster increase in labor productivity than the average wage increase.
3. The expenditures connected with the mechanization of work.
4. The services of auxiliary organizations and outside services (steam, water and transportation in connection with earth-moving work, etc.).
5. Overhead expenses. The latter include: administrative costs, supplemental wages of workers, extra charges connected with the payroll, communal expenditures involved in construction, the cost of guarding the construction premises, organized recruitment of workers, etc. The overhead expenses in the budget account for a definite percentage of all the other expenditures which comprise the so-called "direct expenditures." The ratio between the overhead and direct expenditures in production, in percent, is graduated for various industries and is used as a basis for fixing the limit of overhead expenses in the budgets. For installation

work, the ratio between the overhead expenses and the base wage rate of the workers is used. The provisions in the plan for reducing the overhead expenses, as compared with those indicated in the budget, are based on the possibility of speeding up construction and improving the organization of work.

The measures now carried out to promote the industrialization of construction will substantially reduce the cost of construction and installation work. This was proved by the practice of the leading construction organizations. Indicative in this connection is the example cited at the builders conference in 1954 from the experience of Kharkov trust No 86. By replacing the planned metal carrier installations in one of the machine-building shops under construction by ferroconcrete installations, the trust workers succeeded in reducing the expenditure of metal from 105 to 45 kg per square meter of floor space in the shop. Construction costs were reduced by about one million rubles.

Calculating the reduction in the cost of construction and installation work on a national economic scale is quite complicated. In planning a single construction organization it is possible to analyze the available figures in greater detail. It is, in particular, possible to avoid the shortcomings inherent in planning output and material-expenditure norms based on one million rubles' worth of construction and installation work. It is possible to fix definite norms for different physical volumes of work with reference to individual construction organizations. Consequently the total percentage of the reduction in construction cost can be altered on the basis of the computations made for different organizations.

Reflected in the approved quotas of cost reduction in construction and installation work is the general aspect of the measures designed to produce an economy in the use of embodied and current labor in production.

The state work quotas for all the major aspects of the development of the construction industry discussed above are approved in the national economic plan.

All these work quotas apply to the construction organizations of both the construction and nonconstruction ministries. The capital construction quotas for the nonconstruction ministries are specified in all sections of the plan.

To ensure the successful implementation of the state plans for the development of the construction industry, it is first necessary to inform the various construction organizations about those plans on time. The failure to do so is one of the principal reasons for the widespread setback in construction work in the first quarter of the year.

The builders conference in 1954 emphasized that the setback in construction in the first quarter of the year, as compared with the fourth quarter of last year, can and must be liquidated. To achieve that aim, it is necessary to complete the coordination of the title lists, the legalization of the financing operations, the preparation of technical documentation, and the approval of plans and the solution of other problems not later than 2-3 months before the first of the year.

It has now been decided that the annual capital construction plans will be approved not later than 15 November so that they can

be made known at the construction project before 1 December of the year preceding the plan year.

Making the plan quotas known on time should not under any circumstances adversely affect the distribution of work quotas among the various construction projects. The struggle against the practice of scattering funds in construction calls for a well thought-out distribution of quotas and funds among the various construction projects designed to have the projects to be commissioned begin operations on schedule.

In several cases the client ministries include additional requirements for their projects under construction that are not needed for commissioning the mentioned projects on time. If, for example, the cost of the basic equipment amounts to only 40-50% of the total cost of the enterprise, as is often the case, the importance of concentrating on the completion of such an enterprise without dispersing the available funds among secondary targets becomes obvious. The artificial expansion of the projects to be commissioned is conducive to a dispersal of effort, tends to delay the commissioning of the basic equipment and freeze the government's large capital investments.

It is very important to effect a more even quarterly distribution of the capital works. This is necessary for the proper organization of labor in construction, the elimination of labor turnover, and the systematic commissioning of completed projects.

The practice of the unsystematic introduction of new productive capacities, particularly the concentration on such introduction in the fourth quarter of the year, has not yet been eliminated.

Thus in 1953 some of the new productive capacities in many branches of heavy industry (for pig iron smelting, the production of tractors and combines, for electric power plants, etc) were readied for exploitation in the fourth quarter of the year while others were completed only 50-60% and over. Fifty percent of the living floor-space was completed in the fourth quarter.

The frequent changes made by the ministries and departments in the title lists of the projects under construction are absolutely intolerable. Close to 10,000 changes were made in the plans of various construction projects in 1953 by 9 ministries alone.

According to the decision of the TsK KPSS and the Council of Ministers USSR of 23 August 1955, any changes in the construction lists may be made only by agreement with the contracting construction organization.

Familiarizing the construction organizations with the plans means more than improving the distribution of the approved over-all work quotas among the various builders; it also means the popularization of the advanced work methods incorporated in the state-fixed work quotas among the construction workers. The achievements of the leading workers are not easily gained victories. They have to be fought for, and call for much creative effort. It is not enough therefore to include the resultant indicators of the advanced construction projects in the plan figures. All the construction workers should be shown how the successes of the leading workers have been attained, and what difficulties they had to surmount.

The propagation of the methods, ways and means employed by the leading construction workers is an organic part of the planning.

It means practical work with people without which all planned quotas, no matter how well thought out, will amount to no more than figures on paper.

The development of the construction industry largely depends on the organizational improvement of the construction organizations. Technical progress and the industrialization of construction calls for corresponding organizational changes in construction work. The chief aims pursued by such changes are the enlargement and specialization of the construction organizations.

What we have recently been witnessing, however, was not an expansion of the construction organizations but an increase in their number and the creation of many weak construction organizations. One third of the 7,500 contracting construction organizations available in the Soviet Union by the end of 1954 had an annual operation volume not exceeding 5 million rubles. According to the 1954 figures, about 60% of all general construction organizations in 218 large cities were unable to keep even a small excavator with a  $0.5 \text{ m}^3$  scoop working at full capacity.

Handicraft methods of work, resulting from an excessive division of the work volume and a multiplicity of small construction organizations, have been noted frequently not only in the construction carried out by the clients themselves but also by the contracting organizations.

The expansion of the construction organizations produces positive results.

Thus at the beginning of 1954 construction in Moscow was done by 132 organizations belonging to 35 different ministries and

departments. To improve housing and civilian construction and liquidate the practice of dispersing material and technical resources, the Glavmosstroy (Main Moscow Construction Combine) was created in April 1954. It consists of 56 trusts and 28 construction and installation administrations which had previously belonged to 21 ministries and departments.

Created within the Glavmosstroy were 5 general-construction territorial administrations and 2 specialized administrations (for road and bridge building and underground installations). New trusts were also set up for foundation building (Fundamentstroy), finishing work and motor transportation and for the mechanization of construction work. The Moscow City Executive Committee (Mosgorispolkom) drafted a 3-year plan for the distribution of housing and cultural construction projects. The enlargement and specialization of the construction organizations and their distribution by districts produced positive results as far back as 1954. The introduction of additional living floor-space has been sharply increased and the efficiency of the Moscow construction workers considerably improved.

After the All-Union builders conference, the Yuzhuraltyazhstroy (the South Ural heavy industry construction trust) adopted measures to expand its organizations. The trust is engaged in industrial and civilian construction in several cities. Before the end of 1954 it comprised 9 construction and installation administrations. They were later combined into 6 administrations with an annual construction capacity of 15 to 35 million rubles each.

The consolidated administration, including the Chkalov and Sol'-Il'stakoye administrations, carried out considerably more work

than during the corresponding period last year. The first quarterly plan of 1955 was overfulfilled by 24%. The output rate has gone up 37.2%, as compared with last year, and no losses have been sustained.

Specialization by sectors and the adoption of assembly-line construction methods have created more favorable conditions for the proper utilization of workers and for raising their output. All the work on the specialized sectors is now carried out by complex brigades.

"We must take a course toward a decisive expansion of the construction organizations. Without it, any industrialization of construction would be out of the question," N. S. Khrushchev told the builders conference in 1954.

The further strengthening of the construction organizations calls for a smooth organization of the work according to rigid technical regulations. But not all the construction organizations have as yet adopted rigid technical regulation governing construction work.

The great possibilities for perfecting construction work, inherent in the application of such regulations, have been revealed by the experience of several construction organizations. Thus the Odessa construction trust, following the example of the Zaporozhstroy trust, has been strictly observing all the technological regulations in its housing construction since 1952. Following the introduction of the regulations, the working time spent per one million rubles' worth of construction work in administration No 2 of the trust was reduced by 2,176 man-days. Before the introduction of such regulations, the cost of construction work usually exceeded the budgetary cost of 5-6%, but it is now 2% below the budget figure. The quality of the construction has also been improved.

Very much of the construction and installation work consists of transportation operations. The improvement of transportation in construction is very urgent since considerable overexpenditures have been incurred by the irrational organization of freight hauling. The tried and tested method of centralizing the transportation of construction materials should be adopted on a large scale with a view to reducing transportation costs.

Here is one of the examples told by Kuznetsk shaft-sinking miners:

"The work of the Kuznetsk shaft-sinkers is greatly hindered by the slow removal of the earth from the shaft to the dumping place, and the poor supply of materials, particularly concrete, for building permanent props.

"In the Donets Basin truck drivers are paid for every cubic meter of soil they remove. Four trucks are usually assigned to service the shaft, and a fifth is kept in reserve. Idle facilities are a rare phenomenon.

"Only one 3-t dump truck is assigned to the Kuznetsk mine shaft. The drivers are in no hurry to return from their hauling trips, and instead of the average 20-25 round trips the trucks make not more than 10-12. A similar situation exists in the delivery of construction materials. Occasionally, when patience runs out, you go up to the surface and reprimand the driver for undermining the work. But he has no incentive to hurry. The drivers of the motor pool working for the construction administration of the 'Berezovskaya-1' mine get paid by the hour whether they actually work or not" (Stroitel'naya Gazeta [Construction Gazette], 29 April 1955).

Wage-leveling, snap estimates of work, the wrong payment of wages, etc, are still practiced in some construction sites. The measures now taken to streamline the system of work quotas and wages in construction (see Chapter IV) will create the necessary conditions for the final elimination of all sorts of violations of the socialist principle of payment according to the quantity and quality of the work.

The display of experimental models of several construction projects will help strengthen the construction organizations from an organizational point of view.

The Ministry of Construction USSR will display experimental models of 6 industrial and 4 apartment buildings in 1955. By preparing the sites for its experimental construction, the ministry is pursuing the aim of a thorough study of the industrial construction methods, on one hand, and the popularization of such methods, on the other. The blueprints of the buildings and the plans of construction organization fix the expenditure of labor at 0.6-0.7 man-days per one cubic meter of building space, and the prefabrication factor (koeffitsient abornosti) at 0.55-0.65; for apartment buildings the figures are 0.75 and 0.70 respectively. The construction of 10 experimental enterprises for display purposes was carried out in 1955 by the Ministry for the Construction of Enterprises of the Metallurgical and Chemical Industry. They consist of 5 industrial shops and 5 dwelling houses.

The Ministry of Transport Construction USSR is building 10 experimental engineering installations, industrial and dwelling buildings in 1955.

Model construction or, more properly, the assembly of production shops, houses, schools, hospitals and machine-tractor stations is now under way on almost 200 construction sites. The construction of experimental project models represents an important stage in the progress toward the mass industrialization of construction. A new permanent All-Union exhibition of construction and architecture will be built in Moscow in 1956-1958 with a view to demonstrating the achievements in construction technique, architecture, and the production of construction materials, and popularizing and introducing advanced experience.

The assumption made in Chapter III was that all the necessary facts and figures for the selection of the desired construction projects, to be entered into the title lists, were available. The provision of all the necessary facts and figures for the capital works plan, however, is itself an independent, very important, and complicated problem. Indeed, if a sufficient number of project designs, financial and budgetary calculations and technical projects and estimates are to be available before the plan is drafted, they must be prepared beforehand in every detail to meet the plan's requirements. Worthless and unnecessary projects that cannot be utilized, on the other hand, should not be included. More than that, even suitable projects that may not be needed in the next few years should be kept down to a minimum figure. Project planning requires large funds. We must see to it that such funds are not spent unnecessarily or long before the need for the projects may arise. This is all the more important since projects planned for future construction may rapidly become obsolete and lag behind technical progress. All that means that project planning itself must be carried out according to plan.

Project planning is divided into:

(a) the planning of projects to be built during a given year.

These plans provide for the preparation of technical projects, budgets and blueprints of the items to be included in the title list for the same year. In some cases, if the item is included in the title list without the preliminary facts and figures, provisions are made for appropriate project tasks;

(b) the planning of projects to be constructed in future years. According to these plans all the necessary facts and figures are compiled during the current year for the construction projects to be started within the next one, 2 or 3 years.

What is the plan of future construction work based on? Obviously, the least such a plan can be based on is the general perspective of capital works development in the next years. As has been pointed out before, even the annual capital works plan cannot fully conform to the requirements of the national economic plan without determining the perspectives of the entire economy of the country far enough in advance.

The objective characteristics of the reproduction of basic capital urgently demand the perspective planning of the entire national economy not only for a 5-year period but also, at least in general outline, for 10-15 years into the future. Following are the peculiar characteristics of basic capital reproduction which are reflected in the planning of capital works:

1. Basic capital remains in service for many years. Thus the planning of capital works also includes, in general outline, a plan for the future exploitation of projects to be constructed in

conformity with the perspective requirements of the national economy. The decisive element in this connection is the coordination of the capital works plan with the balance-sheet of productive capacities envisaged in the long-range perspective and based on perspective technical progress.

2. The creation of basic capital, particularly of the massive type, takes a long time. The planning of capital works, therefore, also includes the planning of partial construction to be completed by the end of given plan year; and such planning can be done only on the basis of scientifically well-founded perspective plans for the development of the entire national economy and its leading branches.

3. Basic capital is characterized by its individual peculiarities. Every new item of basic capital -- not only in different industries but also in the same industry -- has its own individual characteristics which should be taken into account beforehand. The further industrialization of construction and the conversion to prefabricated production methods will bring about the steady replacement of many unique projects by standardized and interchangeable projects.

The plan for preparing projects to be constructed in future years tends to prolong the period of time for which perspective plans of the development of the entire national economy are to be made with the aid of basic indexes.

It was pointed out at the builders conference in 1954 that one of the principal conditions for the proper organization of project-planning was the drawing up of plans or so-called schemes

for the territorial distribution of industries over a long period of time, approximately 5 years, and in some cases 10 years.

It may be added, in this connection, that the territorial distribution schemes themselves should be coordinated with each other and should therefore be based on the perspective development of the national economy as a whole.

The perspective plans of the development of the national economy are of prime importance in that they can reflect the requirements of the economic laws of socialism in the annual plans of basic capital reproduction.

That does not mean, however, that the necessity for, and value of, the perspective plans are determined solely by the planning of basic capital reproduction. The necessity for raising the level of perspective planning is also dictated by the need for a scientific substantiation of the expanded reproduction plan from another aspect, labor force, and trained specialists. The training of specialists is not done all at once nor in one year; it takes into consideration the perspective utilization of the cadres in the future. To set up the right program for training qualified workers and specialists, we must know where they will be required later, after a number of years, and what they may be called upon to do under the conditions of advanced technology now introduced in all branches of the national economy.

The coordination of a given object of capital investment with the needs of the national economy for basic capital reproduction directly depends on the quality of the project-planning and budgeting.

A given volume of capital investments in an enterprise under construction, say 100 million rubles, as estimated in the budget, may not take into account the possible increase in productive capacity attainable by the economical operations and progressive improvements in construction envisaged in the project.

The better the construction methods applied to buildings and installations, the wider the use of progressive industrial methods of construction and the more advanced the equipment designed for the enterprises under construction, the more productive capacity and living floor space, etc, can be obtained with the same volume of capital investments.

The improvement in project planning is the best way of improving the efficiency of capital investments.

Pointed out above were the requisites for selecting the necessary items for inclusion in the title list of projects assumed to be perfect from the viewpoint of capital investment efficiency. These prerequisites, applying to the process of planning the capital investments for the projects under consideration, should now be augmented by the requisites for the planning of the projects themselves.

They consist of the following:

1. Assuring the highest possible level of economy in the exploitation of the future enterprise, road, dwelling houses, etc. This requires, first of all, that the construction of the object under consideration be carried out in keeping with the latest technology and with its perspective development.

2. Assuring a maximum economy in the labor, material, and financial resources required for the construction of the planned project and the highest possible speed of construction. That calls for (a) eliminating any excesses in planned projects and budgets, excessive floor space in buildings and installations, inordinately large sites and communication facilities on them, extravagant architectural finish on buildings and installations and superfluous numbers of auxiliary and service buildings and installations, etc; (b) selecting the best materials designed to develop prefabricated methods of construction, and planning progressive expenditure norms of materials, machine-days and labor required for the construction of various elements of the planned buildings and installations.

Both of the mentioned prerequisites for planning must be considered. The economy of the projects from the point of view of construction should not be achieved at the expense of their quality, durability, or economical exploitation. The rapid development of the heavy industry and the prospects for its further expansion make it possible to concentrate on the best project models available in the Soviet Union and the rest of the world. The economy in construction must supplement the economic exploitation of the planned projects.

An asphalt road is cheaper to build than a concrete road. But, as N. S. Khrushchev said, "an asphalt road is built for 10 years while a concrete road will last 100 years. We must concentrate on the development of the cement industry with a view to building concrete roads. As the saying goes, we are not rich enough to afford cheap construction. If the construction is costly, that is of high quality and durability, it will last long enough for you to forget

when it was built" (N. S. Khrushchev, O shirokom vnedrenii industrial'nykh metodov, uluchshenii kachestva i snizhenii stoinosti stroitel'stva, page 43).

The further improvement of construction on the basis of advanced technology depends largely on the improvement of project and budget planning.

There is one planning (including research) worker for every 11 construction and installation workers in the USSR but the necessary facts and figures are frequently very late in reaching the construction sites, incomplete, and of poor quality.

In 1954 about 40% of all the new above-limit construction projects included in the title lists were not backed by the required planning documents. The situation in 1955 is not much better. A check on 95 construction projects of the ferrous metallurgical industry made by the industrial bank of the USSR disclosed that 274 construction items in those projects had not been backed by approved plans and budget estimates.

And yet it is known that to prepare a well-substantiated requisition for material and technical supplies for next year's operations and construction blueprints, the builders must have a well-defined plan ready for June-July of the preceding year and the required technical documentation covering the operations of the plan year, by July-August.

Project planning on a national economy or ministry scale is called upon to end the practice of planless and budgetless construction. The systematic nature, rhythm, and accuracy stem from the corresponding characteristics of the project and budget documentation required for both the title list and actual construction work.

The prerequisites for project planning can be met more fully under conditions of standard project planning.

The large-scale development of duplicate and standard-project construction offers enormous possibilities for economizing on a national scale both in project planning and in construction.

The problem due for solution now is the achievement of a sharp increase in the relative share of standard and duplicate project construction. The forced production of standardized and uniform structural components and parts is an indispensable and integral part of the entire process of industrializing construction.

There are 1,100 project-planning organizations in the USSR. Of them 152 are partially employed in planning standardized projects.

In housing construction, about 60% of all houses are now built according to standardized plans. But that is still not enough. The situation in industrial construction is much worse. Only 12% of the total volume of industrial construction in 1953 was carried out according to standardized plans. The situation was not much better in 1954. We must see to it that the bulk of industrial construction is carried out under standardized plans within 2-3 years.

The quantity and nomenclature of available plans for standardized projects are not in keeping with the growing demands of industrial construction. But there are many possibilities for introducing duplicate and standard-type projects on a large scale. The plans for 600 individual production shops of the machine-building industry drafted by the Giprotyazhmas, the Giproavtotraktorprom, and other organizations were reviewed by Giprotis which found it possible to apply 26 inside clearance schemes to all 600 shops without

adversely affecting the technological process or increasing the cost of construction.

In their 23 August 1955 decision the TSK KPSS and the Council of Ministers USSR laid particular stress on that the interests of construction industrialization call for better project planning, increasing standardization of project planning, and the use of standard structural components and parts. It has been decided that, beginning in 1956 (in the earthquake areas, in 1957), the construction of new houses, schools, general hospitals, children's institutions, movie houses, clubs, stores, dining halls, bath houses, laundries, rest homes, sanatoria, and technical and trade schools must be carried out according to standardized plans. Nonstandard projects will be allowed only in certain cases. The construction of industrial buildings and installations, transportation and agricultural projects, as specified in a special list, will also be subject to standardized planning.

The introduction of the construction of standardized projects will make it possible to change from the present 3-stage method of planning to a 2-stage method without any technical project plan or budget. This is of no little importance for the construction business. For example, the project specifications for an electric power plant could be reduced by 1,800 pages of text and 430 blueprint sheets under the 2-stage project-planning method. The planning time and costs of such specifications could be reduced accordingly.

One of the biggest shortcomings is the low quality of project and budget planning. This drawback was sharply criticized by the All-Union builders conference.

Until recently, the poor quality of project and budget planning was due to the fact that obsolete and exaggerated standard specifications had to be used for such planning. The standard norms and regulations (SN and R) introduced on 1 January 1955, reflect the latest technical policy of the CP and government on construction. The construction norms and regulations are divided into 4 parts: part I, construction materials, structural components and parts; (part II, standards of construction planning; part III, regulations governing construction and acceptance of finished construction jobs; and part IV, budgetary appropriation norms for construction work.

The budgetary norms indicated in Part IV have been worked out to replace the now obsolete handbooks of expanded norms published during 1935-1945 and used until recently. To get an idea of how far construction technology has advanced, suffice it to point out that about 1/2 of the budgetary norms have been replaced by new ones since they apply to construction designs not envisaged in recent handbooks of expanded budgetary norms.

The new budgetary norms are used for calculating uniform unit costs for different areas and determining general budgetary cost indexes (per one cubic meter of building space, one kilometer of road, etc.).

All that creates exceptionally favorable conditions for raising the level and increasing the speed of project planning, improving the quality of the plans and budgets, improving the organization of work and self-supporting operations in construction, and enhancing the role of the financial organs in the performance control of the plans.

The plan for the development of the construction industry is not merely a plan for the distribution of construction and installation work among the builders. It exerts an active reciprocal influence on the planning of capital works, namely:

1. The capital works plan must be further elaborated and corrected should the actual possibilities for the development of the construction industry during the plan period turn out different than those required to secure the planned volume and structure of the capital investments.
2. The progressive changes envisaged in the construction and allied industries may force a revision of certain obsolete projects and budgets and corresponding changes in the entire capital investments plan.
3. The plan for the long range development of the construction over several years directly affects the planning of construction for future years and, through it also, the capital works plans.

#### CHAPTER VI. PERFORMANCE CONTROL

##### OF THE CAPITAL WORKS PLAN

Planning does not end but only begins with the drawing up of a plan. Planning includes effective control over the performance of the plan and the struggle for its realization.

The performance control of the capital works plan has certain peculiar characteristics. These stem from the fact that capital construction goes through a long production cycle. In most of the industries it is, as a rule, possible to judge plan realization by current commodity output. In construction, on the other hand,

it is impossible to wait for the completion of a particular project in order to judge the work of the construction organization in view of the lengthy production cycle usually lasting more than a year. Besides, the nature of the work changes at the different stages of the construction of the same project. Hence the need for a systematic spot control over the performance of every construction organization engaged in the simultaneous construction of various projects. The average figures on the volume of investments, though important for accounting purposes, are quite inadequate for judging the construction process. A concrete analysis of the operations on the construction site is necessary for the prevention and timely elimination of the shortcomings in construction.

The performance control of the capital works plan must take into account all the quantitative and qualitative indexes applying to the volume and nature of the operations; the introduction of new projects, the reduction of material expenditures per unit of work; the implementation of the plan for higher labor productivity, lower construction cost and the plan for securing the necessary material and technical supplies.

The control over the implementation of the plan focuses special attention on the projects to be commissioned. Effective control over the timely commissioning of completed projects encourages a better organization of all the plan-specified work and the concentration of facilities on projects that can be turned from potential into productive basic capital in the shortest possible time.

Nor should the creation of a standby material stockpile in construction be left out of control. The problem is to coordinate the introduction of new basic capital with the planned volume of

work on projects whose construction will continue into the next year. This can be achieved only by a smooth organization of work.

That is why the successful outcome of the control over the plan depends largely on when such control was initiated. The first object of the control over the capital works plan is to ascertain how soon the state capital works plan was distributed to the ministries, departments, and councils of ministers of the union republics and to the various construction organizations. The rhythmic operations facilitating the fulfillment and overfulfillment of all the quotas under the capital works plan depend to a large extent on the itemized lists of construction objects, on the proper priority order of work and material expenditure and on the elimination of delays in construction.

Thus the Ministry of the Lumber Industry USSR fixed the annual volume of the capital works plan for most of its construction projects at only 5-12% of the construction budget. This prolonged the construction of industrial logging camps to 8-15 years instead of the 1-3 years required to complete those enterprises. If the control of that ministry's capital works plan began with the distribution of facilities among the logging camps under construction, instead of the results of the annual operations carried out by the construction organizations, such mismanagement would have been corrected long ago.

Effective control over the implementation of the capital works plan is facilitated by the monthly operations plans of the construction administrations. These plans are worked out according to instructions from the trust and are approved by them. The state capital works plan is expressed in concrete terms in the monthly plans.

Control over the implementation of the monthly plan therefore amounts to controlling the entire state plan as it applies to a particular construction organization and a particular month.

The accounting and statistical system is adjusted to the system of annual plans with their quarterly breakdowns and to the operational quarterly and monthly plans. The ministries and planning organizations of the union republics and the central state planning organizations are able to judge the implementation of state quotas by the total figures contained in statements of operations.

The effective control over the implementation of the plan, however, calls for an analysis of the reasons for any departure from the plan. The over-all figures merely show a departure from the plan and, at best, indicate only general reasons for it (for example, the introduction of new projects by such and such organizations is not being realized due to the failure to receive such and such equipment, etc.).

General information is not enough to determine what measures should be taken. What is needed for that is additional information from the spot which can help to ascertain the reasons for any departures from the plan. The best decision, however, can be reached only after a spot analysis, at the construction project, of the hindrances to the normal construction process of any important project.

The purpose of plan control is also to propagate such new progressive methods of organization and construction technology as would help the leading workers to successfully cope with their tasks and fulfill and overfulfill their construction plans. Progressive

construction methods can be introduced only after a thorough study of the leading experience and the intense organizational work at the construction sites designed to popularize advanced experience and implement certain specific measures has been made.

It should be emphasized that under modern production conditions the successful solution of the problem of speeding up construction and reducing its cost can be achieved through a system of complex measures based on the peculiar features of a particular construction project, construction labor force, available machinery, etc.

The excellent results achieved by the leading organizations are due precisely to their observance of a rigid regime in the organization of construction and a well thought out production chart prepared in great detail for all their subdivisions.

This is what was reported in the press about the experience of the Dzerzhinskiy trust which built and commissioned a powerful furnace with all the numerous objects that go with it in 8 months.

All the construction work was supervised by a "staff" whose chief, the head of the complex brigades, was responsible for all the work regardless of where and by what organization it was performed. Thus the administration of the entire work complex was not confined within the usual production-administration framework (construction administration, construction sector, etc). Subordinated immediately to the "staff," in the technological field, were all the operations: the general construction carried out by general contractors; the specialized jobs performed by more than 20 specialized subcontractors and, very important, by the client's organizations, that is, the metallurgical enterprises.

The organization of work provided for the maximum supplies of mechanisms and required construction materials to the construction organizations, and the production charts provided for the coordination of the work of all construction and specialized organizations. Such coordination was maintained when the work was concentrated on the blast furnace itself and also when it was done outside the construction premises.

When the preparations for construction were still under way, a special priority chart for the production and delivery of the required metal products was drawn up by the Dzerzhinskiy trust together with the supplier plants. Participating in the drawing up of the consolidated chart were all the specialized organizations, and that prevented any possible miscalculations, errors, and lack of coordination.

Following their approval by the managing trust, the weekly and daily production charts acquired the force of an immutable law for all the participants in the blast furnace construction. Performance control was exercised by a staff of dispatchers.

New and progressive installation methods were used from the very beginning of the construction. The metal parts were installed only in the shape of large components weighing up to 40 t.

Several changes designed to improve the production and installation of structural components were introduced by the builders during the work. The successful operational changes made in the project were largely facilitated by the permanent presence of the chief engineers who helped to work out the various rationalization proposals and made the necessary corrections in the blueprints during construction.

All-purpose, complex, and self-supporting installation brigades were organized on the construction site. Each one of them was detailed to do a specific job. For example, Karpov's brigade and 2 team leaders, Byl'chenko and Dekopol'tsev, were detailed to assemble 1,410 t of structural parts of the furnace itself. That assignment was completed in 75 days, and volume of work amounted to almost 3 million rubles. The labor output was almost double the normal rate.

To disseminate such construction experience, it is not enough to possess only general information about the achievements of a leading construction organization. A system of exchanging experience should be set up and measures designed to make the slow construction projects catch up with the advanced ones should be adopted. The successful operations on the construction sites depend also on the utilization of all available possibilities for improving the work of the construction organizations.

One important aspect of the control over the capital works plan is the control over the quality of the work performed by the construction organizations.

The KP and the government demand that an end be put to the vicious practice of accepting and commissioning unfinished and poorly constructed objects. Those guilty of such violations will be called to account.

The system of bonus payments for commissioning apartment houses and cultural buildings has been changed to encourage the struggle for high construction quality. If a completed project is rated "good," it calls for the usual bonus; if the rating is

"excellent" the bonus is increased by 25%. A "satisfactory" rating reduces the bonus by 25%.

An important part in the control over the implementation of the capital works plan, in regard to the volume of operations and reduction of construction cost, is played by the special long-term credit banks such as the Prombank, Sel'khozbank, Torgbank, and Tsekombank. Through their local branches they exercise effective control over construction costs; they have every possibility for exercising control over the construction on the spot.

The KP and trade union organizations bear great responsibility for the construction projects. The individual characteristics of every construction project, the continuous changes in the nature of the work made on the spot and the complications involved in coordinating the work of various construction teams call for more and better work with the masses, for organizing socialist competition and exchanging experience.

The KP organizations head the mass movement of the construction workers for the timely fulfillment of their planned quotas and help in disseminating the leading workers' experience.

Performance control over the capital works plan includes the careful collection and generalization of information on the necessary changes in the organization of construction, that is, the necessary changes in the size, number, and location of the construction organizations; on the necessary changes in the system of mutual relations between contractors and clients, construction organizations and financial organs, etc.

The All-Union builders conference in 1954 showed what great difficulties had to be surmounted by the construction organizations on account of the unwieldy and complicated system of mutual relations between the construction organizations and other economic organizations. In several cases the excessive complexity of the mutual relations between construction and other organizations makes it more difficult to control the performance of the plan.

Let us take the mutual relations between the construction organizations and the financial organs and banks, for example. The system of account settlements between the construction organizations and their clients whereby payments for construction jobs are based on a large number of different price units, sometimes numbering 2,000-3,000, is obviously obsolete. What kind of effective control can any bank maintain under such a system of payments? And this at a time when a system of account settlements on the basis of general indicators has already been introduced and it is justifying itself.

Largely obsolete also is the credit system applied in construction which makes the granting of credits contingent upon the results of the financial and economic operations connected with construction.

The measures now taken to streamline the planning and financing of construction and improving the organizational and technical management of construction are designed to strengthen in every way the system of self-supporting operations of the construction organizations and to improve the methods of controlling the performance of the capital works plans.

The control over the performance of the current capital works plan also serves as a departure point for drafting the plan for the

following period. The figures obtained in the process of controlling the capital works plan, both general figures and those applying to individual construction organizations and projects, are very useful for substantiating every aspect of the capital works plan for the next period.

The capital works plan is substantiated almost entirely by progressive construction norms: progressive utilization norms of productive capacities (balance sheets of productive capacities and equipment); progressive utilization norms of materials (balance sheets of metal, lumber, wall-making materials, etc); and progressive norms of labor utilization (balance sheet of labor forces). Progressive output norms are those approximating the best results already attained by the leading workers in constructions.

The information obtained in the course of the plan control is important for drafting the next plan also because the latter is usually drawn up long before the current plan is completed. Hence the necessity of using the mentioned information for determining the so-called "expected realization" of the current plan.

Finally, performance control of the plan is highly important for discovering the shortcomings in the planning of capital works. It shows where the blunders have been made in the planning, and by whom. The information obtained during plan control also serves to improve the methodology of capital works planning.

All the planning, financial and statistical organs and KP and public organizations are duty bound to exercise concrete and effective control over the performance of the capital works plan on the construction sites.

At the same time, the successful realization of the capital investments plan calls for a systematic analysis of the process of its implementation in general terms, on a national economy scale. The realization of the capital investments plan must be assured not only by the efficient work of the construction organizations but also by the timely delivery of all the required equipment and construction materials; by heavy industry's successful solution of the problems connected with the technical progress in construction, and by training qualified construction cadres on time, etc. The early discovery of the causes hindering the fulfillment of the capital works plan and disrupting the plan for basic capital reproduction is a problem calling for the performance control of the plan on a national economy scale.

The grandiose problems of communist construction facing the Soviet people during the Sixth Five-Year Plan call for the speediest elimination of the shortcomings in construction, capital works planning, project planning, and in the system of financing the plan and controlling how it is carried out.

Paralleling the further expansion of the entire national economy is the rising efficiency in planning the reproduction of basic capital in the socialist national economy of the USSR.